

# Caddisfly Fauna of the Vicinity of Yamagata Prefecture, with Descriptions of Thirteen New Species

Mineo KOBAYASHI

## 山形県下の毛翅目について

わが国における毛翅目の分類学的研究には、多くの報告があるが、東北地方の毛翅目についての研究は少なく、わずかに津田松苗博士（1942）の報告があるのみである。著者は白畠考太郎氏の好意により、白畠氏自身が、1967年から1970年の4年間にわたって、山形県下で採集した毛翅目の成虫標本を分類学的に研究する機会を得ることができた。その一部の結果をまとめることができたので、日本産毛翅目の分類学的研究の一環として、ここに報告する次第である。

研究の結果、国際命名規約にしたがって、新種として報告するものは下記の13種である。  
ナガレトビケラ科 (*Rhyacophilidae*) に属するもの 1) *Rhyacophila imagamiensis*,  
2) *Rhyacophila mayaensis*, 3) *Rhyacophila tachikawana*, 4) *Rhyacophila shigawana*, 5) *Rhyacophila minoyamaensis*, 6) *Rhyacophila azumaensis* の6種,  
カワトビケラ科 (*Philopotamidae*) に属するもの *Sortosa niitakaensis*, シマトビ  
ケラ科 (*Hydropsychidae*) に属するもの *Diplectrona tohokuensis*, エグリトビケラ  
科 (*Limnophilidae*) に属するもの 1) *Apatania dhokaiensis*, 2) *Apatania momoyaensis*, 3) *Apatania shirahatai*, 4) *Nothopsyche yamagataensis*, 5) *Stenophylax dentilus* の5種、計13種である。

（小林 峰生）

The caddisfly of the Northeastern area of Japanies Island were successively by Dr. Tsuda (1942). But still now, it is only very insufficiently known. I had an opportunity of studying the specimens of this interesting group of insects which were collected by Mr. K. Shirahata in the vicinity of Yamagata Prefecture from 1967 to 1970.

Mr. Kōtarō SHIRAHARA kindly presented to me all the specimens reported here, to whom my cordial thanks are due.

## I. RHYACOPHILIDAE

1. *Rhyacophila kisoensis* TSUDA

1 ♂ (M. 2561) in alcohol; Mt. Maya, Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; May 10, 1969; K. SHIRAHATA leg.

2. *Rhyacophila nakagawai* KOBAYASHI

4 ♂ (M. 2515a, M. 2515b, M. 2515c, M. 2515d) and 1 ♀ (M. 2515e) in alcohol; Mt. Maya, Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; May 10, 1969; K. SHIRAHATA legs.

3. *Rhyacophila shiraishiensis* KOBAYASHI

1 ♂ (M. 2484) and 1 ♀ (M. 2487) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; September 18, 1967; K. SHIRAHATA legs.

4. *Rhyacophila* sp.

3 ♀ (M. 2498, M. 2499a, M. 2499b) in alcohol; Shenjogahara, Mt. Chokai National Park, Yamagata Prefecture; May 26, 1969; K. SHIRAHATA legs.

5. *Rhyacophila* sp.

1 ♀ (M. 2478) in alcohol; Mashuda, Yahata-machi, Akumi-gun, Yamagata Prefecture; March 19, 1967; K. SHIRAHATA leg.

6. *Rhyacophila* sp.

2 ♀ (M. 2540, M. 2589) in alcohol; Mt. Maya, Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; May 10, 1969; K. SHIRAHATA legs.

7. *Rhyacophila ulmeri* NAVAS (Plate I. A. B.)

1 ♂ (M. 2492) in alcohol; Sheba, Tachikawa-machi, Higashitagawa-gun, Yamagata Prefecture; May 6, K. SHIRAHATA leg.

This specimens agrred satisfactorily with figures of *Rhyacophila ulmeri* NAVAS (1907) that were described by Dr. Ross in 1954. Hitherto, this species were only recorded from China, so that I became new localites of Japan.

8. *Rhyacophila imagamiensis* sp. nov. (Plate 3. C, D, E, F)

Head fulvous, dorsum with three pair of warts, all warts clothed with long golden setae; anterior warts hemicycle, median and posterior warts nearly egg-shaped. Anterior part of dorsum of head with one large wart that were clothed with golden setae. Ocelli present.

Antennae fulvous, two-thrid of the length of anterior wing; basal joint thick, the second joint short; remaining joints with brown pubescence and finely annulated with brown.

Maxillary palpi fulvous, with golden pubescence; five-jointed; the first two

joints shrot and thick, the third joint longer and thinner than the other ones; the forth joint shoter than the third one; terminal joint as long as the forth one, acuted at its the apex.

Labial palpi three-jointed, fulvous. clothed with golden pubescence; basal joint as long as the third one; the second joint longer than the basal one; the third joint rounded at its the apex.

Legs fulvous, clothed with golden pubescence; spurs 3, 4, 4. Spurs fuscous, long, stout, inner spurs of apical tibial spurs and preapical tibial spurs shorter than outer spurs; tarsus of all legs with short fuscous setae.

Anterior wing translucent, clothed with fuscous and golden pubescence, the former forming small irrotations. Veins thick; apical forks nos. 1, 2, 3, 4 and 5 present. Discoidal cell open; median and thyridial cell present. Median cell elongate, thyridial cell shorter than the median cell; cross-vein of thyridial cell vanished, leaving a white mark in that portion; the apex of *Cu* connected with *A* vanished. Anal cell short and with intercostal vein present.

Posterior wing translucent, clothed with golden pubescence; apical forks nos. 1, 2, 3, and 5 present; *r* absent; *r-m* and cross-vein of thyridial cell vanished, leaving a white mark in that portion.

Pronotum fulvonus, with two pair of warts; warts clothed with long fuscous setae; Meso-and metanotum fulvous without wart.

Tergites fulvous, with black small irrorations. Sternites fulvous, the seventh sternites with a small ventral teeth. Tenth segment divided in to three lobes; median lobe elongated, about as long as clasper, gradually taper off to the end; apex downcurved and acuted in lateral view; from above, its apex sharply emarginate; the lobe of side is broaded about one half of the length median lobe, apical margin produced at medile portion. Clasper thick, stout, two-jointed; basal joint long, terminal joint one-thrid of the length of basal joint, inner surface excavated, Peins elongate, not divided.

Measurement: Holotype, body 8.25mm, anterior wing 10.75mm, posterior wing 9.20mm.

Holotype: Male (M. 2512) in alcohol; Imagami-onshen Mogami-gun, Yamagata Prefecture; July 11, 1969; collected by K. SHIRAHATA.

This new species resembles very much to *Rhyacophila modesta* TSUDA in coloration, in size, but differs from it in the structure of male genitalia.

The specific name *imagamiensis* came from the collected site.

#### 9. *Rhyacophila mayaensis* sp. nov. (Plate 4. A, B, C, D)

Head fuscous; vertex with two pair of warts; warts nearly egg-shaped, clothed with fuscous setae; apical portion of vertex with one warts that is clothed with fuscous setae. Ocelli present.

Antennae fulvous, slightly shorter than the length of anterior wing; the basal

joint thicker and longer than the other joints; the second joint much shorter; remaining joints slightly longer than the second one.

Maxillary palpi fulvous, five-jointed; the first two joints short and thick; the basal joint with a few setae; the third joint longer than the other ones; the fourth joint nearly wedge-shaped, as long as the fifth one.

Labial palpi fulvous, three-jointed; the basal joint shorter and thicker than the second ones; the second joint as long as the terminal one.

Legs fulvous, clothed with fulvous pubescence; spurs 3, 4, 4; spurs fuscous, thick, inner spurs of apical tibial spurs and preapical tibial spurs longer than the second outer spurs; tibia and tarsus with a few setae.

Anterior wing translucent, gray, clothed with fuscous pubescence. Veins thick, pale brown;  $R$  forked at its apex; apical forks nos. 1, 2, 3, 4 and 5 present. Discoidal cell open; thyridial cell closed, elongate; median cell open; cross-vein of thyridial cell vanished, leaving a white mark in that portion. Anal cell short and intercostal vein present.

Posterior wing as wide as the width of anterior wing, gray, translucent, clothed with fuscous pubescence. Veins thick, pale brown; apical forks nos. 1, 2, 3 and 5 present. Discoidal cell open;  $r-m$  vanished, leaving a white mark in that portion.

Promotum fuscous with two pair of warts that is clothed with long setae; meso-and metanotum fuscous, without wart.

Sternites of the eight segment with a short ventral teeth. The tenth segment broad, two process of apical margin teeth-shaped in dorsal view. Clasper thick, two-jointed; basal joint about twice of the length of apical joint. Lateral lobes of the tenth segment divided in to two lobes; from side, lateral lobes bilge-shaped.

Measurement: Holotype; body 4.70mm, anterior wing 6.90mm, posterior wing 6.10mm.

Holotype: Male (M. 2518) in alcohol; Mt. Maya, Atsumi-machi, Nishitaganagun, Yamagata Prefecture; May 10, 1969; collected by K. SHIRAHATA.

This new species closely resembles *Rhyacophila transquila* TSUDA in size, venation of both wing, but differs in the structure of male genitalia.

The specific name *mayaensis* came from the collected site.

#### 10. *Rhyacophila tachikawana* sp. nov. (Plate 4. E. F. G. H)

Head fuscous; vertex with three pair of warts, front of vertex with one wart; warts fuscous, clothed with fuscous setae; frontal wart large, nearly triangle; preapical warts small, egg-shaped; median warts round-shaped, larger than preapical wart; posterior warts nearly egg-shaped, largest. Ocelli present.

Antennae fulvous, clothed with dark brown hairs, slightly shorter than length of anterior wing; basal joint thick, stout, longer than other ones; the second joint shortest; remaining joints slightly shorter than basal joint, each joints with fuscous annulations.

Maxillary palpi fulvous, five-jointed clothod with fuscous pubescence; the first two joints short and thick, the third joint longer than other joints; the forth joint as long as the fifth one; the fifth joint acuted at its apex; the second joint with long fuscous setae.

Labial palpi fulvous, three-jonted, thin; basal joint as long as the third joint; the second joint longer than other joints.

Legs fulvous, clothed with fuscous pudescence; spurs fuscous, 3, 4, 4. Inner spurs of all legs longer than outer ones; each joints of tarsus and tibea with a few setae.

Anterior wing clothed with fuscous pubescence, translucent, fulvous, apical portion of *Scr* fuscous, forming a pterostigma. Veins thick, fuscous; apical forks nos. 1, 2, 3, 4 and 5 present;  $R_1$  espacially thicker than other veins. Discoidal cell open; thyridial and median cell present;  $r-m$  and cross-vein vanished, leaving a white elongate mark in that portion. anal cells short and intercostal vein present.

Posterior wing clothed with fuscous pubescence, slightly slender than anterior wing, translucent, fuscous, apical portion of *Scr* fuscous, with a pterostigma; veins fuscous; apical forks nos. 1, 2, 3 and 5 present.

Pronotum fulvous, with two pair of warts; each warts clothed with long fuscous setae. Meso-and metanotum fulvous, without wart.

Tergites fuscous, with fuscous pubescence. Sternites fulvous, apical margin of the seventh sternites with one ventral teeth. The tenth segment short, basal portion broaded in dorsal view; from lateral, the tenth segment thick, lobe-shaped, rounded at its apex. Clasper thick, stout, two-jointed; basal joint long, terminal joint divided in to two lobes, upper lobe finger-shaped, slender and longer than lower lobe; apical portion of lower lobe excavated inwards in dorsal view, with many short setae. Peins divided in to two lobes, each lobes acuted at its apex.

Measurement: Holotype, body 5.75mm, anterior wing 7.0mm, posterior wing 6.00mm.

Holotype: Male (M. 2491) in alcohol; Sheba, Tachikawa-machi, Higashitagawa-gun, Yamagat Prefecture; May 10, 1969; collected by K. SHIRAHATA.

This new species resembles very much *Rhyacophila diffidens* TSUDA in the form of wings, and in the venation, but it can distinguished by the structure of male genitalia.

The specifice name *tachikawana* came from collected site.

#### 11. *Rhyacophila shekigawana* sp. nov. (plate 5. A, B, C, D)

Head fuscous; dorsum of head with two pair of warts; front with one wart; warts clothed with many fuscous setae; apical wart nearly triangle; median and posterior warts nearly egg-shaped; posterior warts longer than

median ones. Ocelli presnt.

Antennae fulvous, slightly shorter than the length of posterior wing; basal joint thicker and longer than other joints, with fuscous setae; remaining joints with fuscous pubescence and annulated with brown.

Maxillary palpi fulvous, five-jointed, sparsely clothed with fuscous pubescence and setae; the first and the second joints thick, shorter than the length of other ones; the third joint slender and longer than the length of other ones; the forth joint shorter than the length of the third joint; terminal joint as long as the forth one.

Labial palpi fulvous, three-jointed, sparsely clothed fuscous setae and pubescence; basal joint shorter than the length of other ones, the first joint as long as terminal one; terminal joint acuted at its apex.

Legs fulvous, clothed with fuscous pubescence; spurs 3, 4, 4, fuscous; spurs of anterior leg shorter than other legs. Inner spurs of each legs longer than outer spurs. Tarsus of posterior leg with a few setae.

Anterior wing moderately elongate, fulvous, clothed with fuscous pubescence; apical portion of  $Sc_r$  fuscous, forming a pterostigma. Veins thick, fuscous;  $R_1$  thicker than other veins; apical forks nos. 1, 2, 3, 4 and 5 present; discoidal cell open; thyridial cell closed; median cell open;  $r-m$  and cross-vein of thyridial cell vanished, leaving a white mark in that portion; apical portion of  $Cu_2$  vanished; anal cells short and with intercostal vein present.

Posterior wing slightly slender than anterior wing; fulvous, clothed with fuscous pubescence; apical portion of  $Sc_r$  fuscous, forming a pterostigma. Veins fuscous; discoidal cell open, apical forks nos. 1, 2, 3 and 5 present.

Pronotum fuscous, with two pair of warts; warts clothed fuscous setae. Meso-and metanotum fuscous, without wart.

Tergites fuscous, sternites fulvous. Sternites of the sixth and seventh segment with ventral tooth. The tenth segment lobe-shaped in lateral view, apical angle slightly produced and rounded. Clasper two-jointed, apical joint bifid, upper lobes shorter than lower lobes. Inner surface of lower lobes with a many setae. Penis long, divided in to two lobes, each lobes acuted at its apex.

Measuremant: Holotype, body 5.20mm, anterior wing 6.70mm, posterior wing 5.20mm.

Holotype: Male (M. 2584a) in alcohol; Shekigawa, Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; June 13, 1970; collected by K. SHIRAHATA.

Paratype; Three Male (M. 2584b, M. 2584c, M. 2584d) in alcohol; Shekigawa-machi Nishitagawa-gun, Yamagata Prefecture; June 13, 1970; collected by K. SHIRAHATA.

This new species closely resembles *Rhyacophila tachikawana* (described above) in appearance, but is distinguished from the latter by the size of body, and especially by the shape of clasper.

The specific name *shekigawana* given to this species was taken the name of the locality.

12. *Rhyacophila azumaensis* sp. nov. (Plate 5. E, F, G, H)

Head fuscous; dorsum with two pair of small warts and a large wart; each warts clothed with long fuscous setae; apical wart nearly triangle, much longer than other warts; median and posterior warts egg-shaped. Ocelli present.

Antennae fulvous, slightly shorter than anterior wing; basal joint thick, with fuscous setae; the second joint shorter than other joints; each one of remaining joints as long as basal joint, with fuscous annulations.

Maxillary palpi fulvous, clothed with fuscous pubescence; the first two joints thick and short; the second joint with fuscous setae; the third joint longer than other one; terminal joint as long as the forth one, acuted at its apex.

Labial palpi fuscous, clothed with short fuscous pubescence; basal joint as long as the length of the second and the third joints; the third joint gradually thining to apically, acuted at its apex.

Legs fulvous, with fuscous pubescence; spurs 3, 4, 4, fuscous, thick; inner spurs of each legs longer than outer spurs; tibia and tarsus with a few fulvous setae.

Anterior wing clothed with fuscous pubescence, hyaline; veins fulvous, thick, apical portion of *Scr* densely clothed with pubescene, forming the large pterostigma. Descoidal cell open, thyridial and median cell present; apical forks nos. 1, 2, 3, 4 and 5 present; *r-m* and cross-vein of thyridial cell vanished, leaving a white mark in that portion; apical portion of *Cu<sub>2</sub>* vanished.

Posterior wing clothed with fuscous pubescence, hyaline; apical portion of *Scr* densely with pubescence, forming the large pterostigma; apical forks nos. 1, 2, 3 and 5 present; thyridial cell present; *r-m* cross-vein of thyridial cell venished, forming a white mark in that postion.

Pronotum fuscous, with two pair of warts; each warts with long fuscous setae. Meso-and metanotum fuscous, without wart.

Tergites fuscous, sparsely clothed with fuscous pubescence; sternites fulvous, apical margin of the eighth sternites with ventral teeth. The tenth segement broader, apical margin lobe-shaped; from lateral, lobes curved downwards; lateral margin of the tenth segment deeply crived forewards. Clasper two-jointed; basal joint thick, longer than the second one in the lateral veiw; from above, the apical parts divided in to two lobes; inner lobes longer, sickle-shaped, its outer margen with a few serrations. From lateral, the second joint short, broader, rounded at its apex; from ventral, inner surface of the second joint excavated.

Measurement: Holotype, body 6.00mm, anterior wing 7.50mm, posterior wing 6.75mm.

Holotype: Male (M. 2557) in alcohol; Niitakayu, Mt Azuma, Yamagata Prefecture; August 27, 1970; collected by K. SHIRAHATA

This new species easily distinguished by the structure of male genitalia from other species of belong to the genus *Rhyacophila*.

The specific name *azumaensis* given to this species was taken the name of the locality.

13. *Rhyacophila minoyamaensis* sp. nov. (Plate 6. A, B, C, D)

Head fuscous, dorsum with three pair of warts, each warts clothed with long setae; frontal wart large; median wart small, nearly egg-shaped; posterior wart elongate, nearly cocoon-shaped. Ocelli present.

Antennae fuscous, shorter than the length of anterior wing; basal joint thick, with long fuscous setae; the second joint much shorter than other joints; remaining joints longer than basal one.

Maxillary palpi fulvous, five-jointed; the first two joints short and thick, the third joint longer and thinner than other joints; the forth joint as long as the fifth joint; the fifth joint with long fuscous setae.

Labial palpi fulvous, three-jointed; the first two joint short, the third joint long; the third joint acuted at its apex.

Legs fulvous; spurs 3, 4, 4; all spurs fuscous, stout; inner spurs of all legs longer than outer spurs; tarsus of anterior and median legs with a few setae; tibiae and tarsus of posterior leg with setae.

Anterior wing comparatively short, fulvous, clothed with fuscous pubescence; apical portion of *Scr* density with pubescence. Veins thick, fulvous; discoidal cell open; median and thyridial cell present;  $R_1$  thicker than other veins, forked at its apical portion; apical forks nos. 1, 2, 3, 4 and 5 present;  $r-m$  and cross-vein of thyridial cell vanished, leaving a white mark in that portion; apical portion of  $Cu_2$  vanished.

Posterior wing fulvous, translucent, clothed with fuscous pubescence; veins thick,  $R_1$  fuscous, other veins fulvous; apical forks Nos. 1, 2, 3 and 5 present;  $r-m$  venaished, leaving a white mark in that portion.

Pronotum fuscous, with two pair of warts; warts clothed with long fuscous setae. Meso-and metanotum fuscous, without wart.

Tergites fuscous, sternites fulvous, the tenth segment thick, long in the lateral view; from dorsal, the tenth segment nearly triangle, acuted at its apex. Clasper thick, two-jointed; the first joint longer than the second one; the second joint divided in to two lobes, upper lobe short, triangled in lateral view; from above, upper lobe elongate, acuted at its apex; lower lobe elongate, rounded at its apex in lateral view; from above, lower lobe rounded at its apical portion, inner surface with many short setae.

Measuremant: Holotype, body 4.80mm, anterior wing 6.60mm, posterior wing 5.60mm.

Holotype: Male (M. 2564) in alcohol; Minoyama, Hirata-mach, Akumi-gun Ya-

magata Prefecture; May 21, 1970; collected by K. SHIRAHATA

This new species closely resembled *Rhyacophila sekigawana* and *Rhyacophila tachikawana* that were described in this papers, but is distinguished by the form of the scond joint of clasper.

The specific name *minoyamaensis* came from the collected site.

## II. CLOSSOSOMATIDAE

### 14. *Glossosoma inops* (TSUDA)

1♂ (M. 2579) in alcohol; Mihamo, Chokai National Park, Yamagata Prefecture; August 19, 1970; 1♂ (M. 2482a) and 1♀ (M. 2482b) in alcohol; Tsukiyamshizu, Ashahi-mura, Higashitagara-gun, Yamagata Prefecture; September 18, 1969; K. SHIRAHATA lags.

## III. PHILOPOTAMIDAE

### 15. *Sortosa niitakaensis* sp. nov. (Plate 6. E, F, G)

Head fulvous, dorsum with three pair of warts and u-shaped wart; three pair of warts nearly egg-shaped; all warts clothed with long fuscous setae. Ocelli present.

Antennae fulvous, slightly shorter than the length of anterior wing; basal joint stouter than other joints, with fuscous pubescence; the second joint longer than other ones; each one of remaining joints with fuscous rings.

Maxillary palpi five-jointed, fulvous; basal joint much short, clothed with long fuscous pubescence; the second joint three time of basal one, the third joint longer than other ones; the forth nearly as long as the second one; terminal joint as long as the third joint, articulated, rounded at its apex.

Labial palpi fulvous, three-jointed, basal joint comparaivey long; the second nearly as terminal one; terminal joint articulated, rounded at its apex.

Anterior wing fulvous, translucente, with an irrarate pattern of lighter markings caused by light and dark pubescence superimposed on a uniform light brown membrane. Vanation complete, with vein  $R_{2+3}$  branched beyond tipe of wing a distance about two thirds to length of *S.* Discoidal, median and thyridial cells closed by the vestige cross-vein.

Posterior wing fulvous, translucente, without marks; venation complete, with vein  $R_{2+3}$  branched midway between *S* and tipe of wing. Discoidal and thyridial cells closed by the vestige cross-vein; *r-m* vanished.

Legs fulvous clothed with short fuscous pubescence; spurs 2, 4, 4; inner spurs of anterior leg as long as outer spurs; outer spurs of median and posterior legs

much shorter than the outer spurs; inner spurs of posterior leg slightly curved outwards at middle portion.

Dorsum of thorax fuscous, pronotum with two pair of warts; warts clothed with long fuscous setae; meso-and metanotum without wart.

The ninth segment fairly elongate, the tenth segment recessed dorsally to the anterior margin of the ninth segment, the apex lightly sclerotized and divided into a pair of closely appressed halves. A long, sclerotized process arise on each side where the base of the tenth tergite joints the ninth segment; this process is long, slender and pointed at the apex. The erci are three fourth as long as the tenth tergite and arise from the base of the tenth segment. They bear a scattering of setae on the apical portion, and inner margin lacerated. Clasper with short, irregular base; apical segment longer and shallower, with comb of sclerotized tooth on its mesal face. The basal segment without articulation process. Aedeagus tubular and simple.

Measurement: Holotype; body 5.05mm, anterior wing 6.01mm, posterior wing 5.02mm.

Holotypc: Male (M. 2559a) in alcohol; Niitakayu Mt. Azuma, Yamagata Prefecture; October 24, 1970; collected by K. SHIRAHATA.

Paratype: Six Male (M. 2559b, M. 2559c, M. 2559d, M. 2559e, M. 2559f, M. 2559g) in alcohol; Niitakayu Mt. Azuma, Yamagat Prefecture; October 24, 1970; collected by K. SHIRAHATA.

This new species resembles very much to fore species belonging to of the genus *Sortosa* in coloration, in size, but differs from its in venation and structure of male genitalia.

This specific name *niitakaensis* came from the collected site.

#### 16. *Sortosa kisoensis* (TSUDA)

1♂ (M. 2485a) and 1♀ (M. 2485b) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitgawa-gun, Yamagata Prefecture; September 18, 1967; K. SHIRAHATA legs.

### IV. STENOPSYCHIDAE

#### 17. *Stenopsyche marmorata* NAVAS

1♂ (M. 2500a) and 1♀ (M. 2500b) in alcohol; the Hanatake Pass, Mogami-machi, Mogami-gun, Yamagata Prefecture; September 18, 1968: 1♂ (M. 2490) in alcohol; the Hanatake Pass, Mogami-machi, Mogami-gun, Yamagata Prefecture; June 16, 1969: 2♂ (M. 2528a, M. 2528b) in alcohol; Niitakayu Mt. Azuma, Yamagata Prefecture; September 18, 1969: 1♂ (M. 2556) in alcohol; Niitakayu Mt. Azuma, Yamagata Prefecture; August 27, 1970: 1♂ (M. 2571) in alcohol;

Niitakayu Mt. Azuma, Yamgata Prefecture; October 26, 1927: K. SHIRAHATA legs.

## V. HYDROPSYCHIDAE

### 18. *Hydropsychodes brevilineata* IWATA

1 ♂ (M. 2502a) and 1 ♀ (M. 2502b) in alcohol; Kitashennichicho, Shakata-shi, Yamagata Prefecture; September 29, 1968; K. SHIRAHATA legs.

### 19. *Hydropsyche nakaharai* TSUDA

5 ♂ (M. 2555a, M. 2555b, M. 2555c, M. 2555d, M. 2555e) in alcohol; the Niitakayu Mt. Azuma, Yamagata Prefecture; August 27, 1970; K. SHIRAHATA legs.

### 20. *Hydropsyche ulmeri* TSUDA

2 ♂ (M. 2480a, M. 2480b) in alcohol; Tsukiyamashizu, Ashai-mura, Higashitagawa-gun, Yamagata Prefecture; September 18, 1967: 2 ♀ (M. 2511a, M. 2511b) in alcohol; Imagami-onsen, Mogami-gun, Yamagata Prefecture; July 11, 1969: 1 ♀ (M. 2531) in alcohol; Tsukiyamashizu, Ashai-mura, Higashitagawa-gun, Yamagata Prefecture; December 16, 1969: 1 ♀ (M. 2586) in alcohol; Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; June 12, 1970. 1 ♂ (M. 2577) and 2 ♀ (M. 2576, M. 2581) in alcohol; Mihamo, Chokai National Park, Yamagata Prefecture 24, 1970: 1 ♂ (M. 2572a) and 1 ♀ (M. 2572b) in alcohol; Tsukiyamashizu, Yamagata Prececture; October 1, 1970: K. SHIRAHATA legs.

### 21. *Diplectrona tohokuensis* sp. nov. (Plate 7. A, B, C, D)

Head fuscous; dorsum with two pair of warts and a apical warts; all warts with fuscous setae; small, oval; posterior wart fulvous, large, nearly egg-shaped. Ocelli absent.

Antennae fuscous, clothed with fulvous hairs, slightly shorter than the length of anterior wing; basal joint short, thick; the second joint as long as basal one.

Maxillary palpi fulvous, five-jointed; basal joint short, the second joint three time of length of basal one, with a few long setae; the third joint slightly shorter than the second one; the forth joint nearly as long as the basal; terminal joint articulated, flexible, much longer than all other joints together.

Labial palpi fulvous, three-jointed; basal joint as long as the second joint; terminal joint two time of length of the second joint.

Coxa fuscous; other segments of all legs fulvous, clothed with fuscous pubescence; spurs 2, 4, 4; all spurs fulvous, clothed with short fulvous pubescence; inner spurs of anterior leg as long as outer spurs, but is thicker than size of

outer spurs; outer spurs of median and posterior legs shorter than inner spurs; apical margin of tarsus with a few short setae.

Anterior wing compalatively wider, subhyaline, fulvous, clothed with fuscous pubescence. Veins fulvous; venation complecate, *Sc* contatcted with *R* by one crosse-vein; *Scr* and *rr* with one crose-vein; apical forks nos. 1, 2, 3, 4 and 5 present. Discoidal cell closed, relatively short and narrow; median cell elongate, compalatively narrow; thyridial cell closed, nearly triangle; *Cur* with one crose-vein; apical portion of *Cu<sub>2</sub>* vanished, leaving white marked line in that portion.

Posterior wing as width as anterior wing, subhyaline, fulvous, clothed with fuscous pubescence. Veins fulvous; apical forks nos. 1, 2, 3, 4 and 5 present; apical portion of *Sc* deeply courved; *Scr* and *rr* with one crose-vein. Discoidal cell closed, elongate; *Srr* with one crose-vein; median cell elongate, longer than discoidal cell; *Cur* with one crose-vein.

Pronotum fuscous, with a pair of warts; warts fulvous, large, elongate. Mesoscutum fuscous, with a large fulvous warts; all warts clothed with long fuscous setae.

Tergite and sternite fuscous, pleurite membranous, milkish white. Lateral margin of the fourth segment with long process.

The ninth segment is enclosing by the eighth segment from lateral view, tergites upwards produced. The tenth segment membranous, with sparse pubescence, both side with chitinous process; process long, sickle-sphaped; from above, margin of the tenth segment deeply concave at its apical portion. Inferior appedage elongate, single joint; from above, apical portion distencted. Penis membranous, rounded at its apex.

Measuremant: Holotype; body 5.60mm, anterior wing 6.60mm, posterior wing 6.00 mm.

Holotype: Male (M. 2565) in alcohol; Minoyama, Hirata-machi, Akumi-gun, Yamagata Prefecture; May 21, 1970: collected by K. SHIRAHATA.

Paratype: Two Male (M. 2493a, 2493b) in alcohol; Sheba, Tachikawa-machi; Akumi-gun, Yamagata Prefecture; May 6, 1969: collecated by K. SHIRAHATA.

This new species easily distinguished form other species that reported from Japan in genitalia structure.

The specifice name *minoyamaensis* given to this species was taken from the name of locality.

## VI. MOLANNIDAE

### 22. *Malanna falcata* ULMER

1 ♂ (M. 2589) in alcohol; Shiraishishinden, Yusha-mahi, Akumi-gun, Yama-

gata Prefecture; September 20, 1970: 1 ♂ (M. 2574) in alcohol; Tsukiyamashizu, Asahi-mura, Higashitagara-gun, Yamagata Prefecture; October 1, 1970: K. SHIRAHATA legs.

## VII. PHRYGANOPSYCHIDAE

23. *Phryganopsyche latipennis* (BANKS)

1 ♀ (M. 2590) in alcohol; Mitsushe, Tsuruoka-shi, Yamagata Prefecture; October 8, 1970: K. SHIRAHATA leg.

24. *Phryganopsyche brunnea* WIGGINS

1 ♂ (M. 2497) in alcohol; Senjogahara, Chokai National Park, Yamagata Prefecture; May 26, 1969: K. SHIRAHATA leg.

## VIII. PHRYGANIDAE

25. *Oligotricha spicata* WIGGINS & KUWAYAMA

1 ♂ (M. 2474) in alcohol; Onmidaira, Mt. Iide, Yamagata Prefecture; August 4, 1965: 3 ♀ (M. 2494a, M. 2494b, M. 2494c) in alcohol; Shenjogahara, Chohai National Park, Yamagata Prefecture; May 26, 1969: K. SHIRAHATA legs.

## IX. LIMNOPHILIDAE

26. *Apatania chokaiensis* sp. nov. (Plate 7. E, F, G, H)

Head blackish brown, dorsum with two pair of warts, frontal part with a wart; all warts on dorsum fulvous, apical wart blackish brown; other warts elongate, egg-shaped.

Antennae fuscous, nearly as long as length of anterior wings; basal joint thick, long, clothed with fuscous pubescence. Ocelli present

Maxillary palpi fulvous, three-jointed, basal joint short, the second joint long, three times of the basal one, terminal joint longer than the second joint.

Labial palpi fulvous, fore-jointed, the first three joint short, terminal joint longest, rounded at its apex.

Pleura fuscous; coxa fuscous, anterior femur fulvous, tibia and tarsi brownish; the femur of median and posterior legs are testaceous, tibia yellowish, last three tarsal joints brownish and armed with black spine; spurs 1, 2, 4; all spurs fulvous, inner spurs as long as outer spurs. Claws developed.

Pronotum blackish brown, with two pair of warts; all warts fulvous, egg-

shaped, clothed with long fuscous setae; inner warts longer than outer warts; mesonotum blackish brown, mesosuctum with a pair of warts; warts small, egg-shaped, with a few setae; metanotum blackish brown.

Anterior wing fulvous, clothed with golden pubescence; costal area and pterostigma very broad and distinct, nearly triangular, more coarsely granulated and more sensely covered with hairs than the rest of the wings. Veins fulvous; discoidal cell closed by a crosse-vein, elongate, curved. Apical forks nos. 1, 2, 3 and 5 present.

Posterior wing lighter than the anterior wing, translucent, clothed with golden pubescence. Veins thick, fulvous. Discoidal cell opened;  $R_4$  conected with  $R_5$  on the apical part of wing; apical forks no. 1 with long stalk;  $R_5$  conected with  $M_1$  by weedly a crosse-vein.

Tergite fuscous; pleurtie and sternite fulvous. Apical margin of the ninth tergite produced at its center; the tenth segment with two pair of lobes; upper lobes separated from basal part, thinner and shorter than lower lobes, clothed with short pubescence; lower lobes thick, nearly as long as terminal joint of inferior appendage, rounded at its apex; distal margin of the tenth segment produced at its center in a bifurcate dorsal plate. Inferior appendage two-jointed, dasal joint thick, long, with many long setae, terminal joint shorter and thinner than basal joint, without setae, rounded at its apex.

Measurement: Holotype, body 6.30mm, anterior wing 9.00mm, posterior wing 7.00mm.

Holotype: Male (M. 2504) in alcohol; Shenjogahara, Chokai National Park, Yamagata Prefecture; May 26, 1969; collected by K. SHIRAHATA.

This new species closely resembles *Apatania aberrans* in size and in colour, but differs from that in venation of anterior wing and structure of male genitalia.

The specific name *chokaiensis* came from the collected site.

## 27. *Apatania momoyaensis* sp. nov. (Plate 8. A, B, C, D)

Head blackish drown, with two pair of warts; apical part with one wart; all warts with long blackish setae; apical wart blackish brown, nearly triangle; middle warts balckish brown, egg-shaped; posterior warts fulvous, larger than middle warts, egg-shaped. Ocelli present.

Antennae blackish brown, shorter than the length of anterior wing; basal joint thicker and longer than remaining joints, with long brown setae.

Maxillary palpi fulvous, three-jointed, basal joint much shorter than other joints; the second joint nearly as long as terminal joint; terminal joint slightly shorter than the second joint, rounded at its apex.

Labial palpi fulvous, short,fore-jointed; basal joint shortest, the second joint as long as the third joint; terminal joint longest, nearly acuted at its apex.

Coxa blackish brown; anterior leg fulvous, femur and tibia with a few blakcish brown spines; the femur of middle and posterior of legs are blackish brown, tibiae fulvous, last three tarsal joints brownish and armed with a few black spines. Spurs 1, 3, 4; all spurs fulvous; apical tibial spurs longer than preapical tibial spurs.

Pronotum blackish brown, with two pair of warts; warts blackish brown, with a few long setae; mesonotum blackish brown, with a pair of warts; warts blackish brown, elongate, with a few long setae. Mesoscutellum blackish brown, with a pair of wart, with long brown setae. Postenotum black. Metanotum blackish brown.

Anterior wing fulvous, clothed with golden pubescence; costal area and pterostigma very broad and distinct, nearly triangural, more coarsely granulated and more sensely covered with hairs than the rest of the wings. Veins thick, fulvous. Discoidal cell elongate, curved. Apical forks, nos. 1, 2, 3 and 5 present.

Posterior wing lighter than the anterior wing, translucent, clothed with golden pubescence. Veins thick, fulvous; discoidal cell opened; apical forks nos. 1, 2 and 3 present; apical fork no. 1 with long stalk;  $M_{3+4}$  crossed with  $Cu_1a$ .

Tergite fuscous; pleutire membrane, milkish white; sternite fulvous; frontal margin of the seventh and the eighth tergites with a few long setae; the ninth segment rather narrow, cuvered by the eighth segment. Frontal margin of the tenth segment curved inwards; upper part produced upwards, lower part produced backwards. Inferior appendage long, two-jointed; basal joint thick, long; basal portion produced backwards, nearly triangle; terminal joint thin, shorter than basal joint, acuted at its apex. Penis long, divided in to two long lobes, apical portion of each lobes with a few long spines.

Measurement: Holotype, body 4.70mm, anterior wing 8.50mm, posterior wing 6.70mm.

Holotype: Male (M. 2561) in alcohol; Momoya, Chokai-mura, Yuri-gun, Akita prefecture; October 24,1970; collected by K. SHIRAHATA.

This new species closely resembles *Apatania kyotoensi* in size and venation of both wings, but differs from structure of male ginaltia.

The specific name *momoensis* cam from the collected site.

## 28. *Apatania shirahatai* sp. nov. (Plate 8. E, F, G, H)

Head fuscous, dorsum with three pair of warts, apical wart fulvous, nearly triangle, with a few long setae; median warts fulvous, with a few long setae; posterior warts fulvous, small, elongate, egg-shaped, with a few long setae. Ocelli present.

Antennae fulvous, parctically as long as length of anterior wing; basal joint thicker and longer than each joints of remaining ones.

Maxillary palpi fulvous, three-jointed; basal joint much shorter than other

joints; the second joint about two time of the basal joint; terminal joint longer than the second one, rounded at its apex.

Labial palpi fulvous, fore-jointed; basal joint shorter than other joints; the second joint as long as the third joint; terminal joint about two time of the third one.

Coxa and femur fuscous; tibia and tarsus of anterior legs fuscous; tibia with a few black spines; tibia and tarsus of remaining legs fulvous, with a few black spines; spurs 1, 2, 4; each spurs fulvous, outer apurs slightly shorter than inner spurs. Clow developed.

Pronotum fuscous, with two pair of warts; outer warts fulvous, with a few blackish setae, egg-shaped, smaller than inner warts; inner warts fulvous, egg-shaped, with a few blackish setae. Mesoscutum fuscous, with a pair of warts; warts fulvous, nearly egg-shaped, with a few blackish setae. Mesoscutellum fuscous, small, nearly triangle, with a few blackish setae. Postnotum and metanotum fuscous.

Anterior wing fulvous, clothed with golden pubescence; costal area and pterostigma very broad and distinct, nearly triangular, coarsely granulated and without pubescence. Veins thick; discoidal cell closed, elongate; C and R with blackish short hairs; apical forks nos. 1, 2, 3 and 5 present.

Posterior wing fulvous, clothed with golden pubescence; Veins thick; discoidal cell opened; apical forks nos. 1, 2, 3 and 5 present; apical fork no. 1 with long stalk;  $M_{3+4}$  crossed with  $Cua_1$ .

Tergite fulvous; pleure whitish milk; sternite fulvous. The tenth segment divided in to two pair of lobes; inner lobes thumb-shaped, shorter than outer lobes; outer lobes wide, thin, spoon-shaped; apical margin of the tenth segment with long two plates. Appendage paraeles long, two-jointed; basal joint thick, thumb-shaped, with a few setae; terminal joint chela-shaped, as long as basal joint. Penis long, apical portion nippers-shaped.

Measurement: Holotype, body 6.40mm, anterior wing 7.30mm, posterior wing 5.65mm.

Holotype: Male (M. 2505) in alcohol; shenjogahara, Chokai Natinal Park, Yamagata Prefecture; May 26, 1961: collected by K. SHIRAHATA.

Paratype: Two male (M. 2506a, M. 2506b) in alcohol; Shenjogahora, Chokai National Park, Yamagata Prefecture: collected by K. SHIRAHATA.

This new species closely resembles *Apatania momoyaensis* which were described about in colour, but distinguished from the latter by the size, venation and structure of the male genitalia.

The specific name *shirahatai* given to this species was taken from the name of collector.

1♀ (M. 2509) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; September 18, 1969: K. SHIRAHATA leg.

30. *Nothopsyche pallipes* BANKS.

1♂ (M. 2530a) and 4♀ (M. 2530b, M. 2530c, M. 2530d, M. 2530e) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; December 16, 1969; 1♂ (M. 2572a) and 1♀ (M. 2572b) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; October 1, 1970; 1♂ (M. 2568) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; Octcber 26, 1970: K. SHIRAHATA legs.

31. *Nothopsyche babai* KOBAYASHI

2♂ (M. 2513a, M. 2513b) in alcohol; Ohota, Shinjo-shi, Yamagata Prefecture; November 18, 1969: K. SHIRAHATA legs.

32. *Nothopsyche yamagataensis* sp. nov. (Plate 9. A, B, C, D)

Head blackish brown; dorsum with small two pair of wart; anterior warts fuscous, egg-shaped, with a few long setae; posterior warts fuscous, egg-shaped, slightly longer than anterior warts, with a few long setae. Ocelli present.

Antennae blackish brown, serrate, stout, shorter than anterior wing; the first joint longer than other joints, clothed with long black setae; the second joint fulvous, short, clothed with short black setae.

Maxillary palpi three-jointed, stout; the first joint much short, fulvous, with golden hairs; the second joint fulvous, as long as the first joint of tarsus of anterior legs, clothed with short black hairs; terminal joint blackish brown, slighlly shorter than the second joint, clothed with black hairs.

Labial palpi three-jointed, shorter than maxillary palpi; the first joint short, flatness, broad, fulvous; the second joint fulvous, two time of the first joint, flatness, broad, clothed with black short setae; the third joint blackish brown, as long as the second joint, clothed with blackish short setae, flatness, broad, rounded at its apex.

Coxa and femur fulvous; tibia and tarsus blackish brown, with many blackish spines; terminal joint of tarsus in posterior leg without spines; spurs 1, 2, 2; spurs blackish brown, inner spurs as long as outer spurs; clow long, very developed.

Anterior wing broad, rounded at its apical margin, brackish brown, clothed with long blackish pubescens. Veins thick, discoidal cell closed, elongate; apical forks nos. 1, 2, 3 and 5 present, all apical forks without stalks; apical fork no. 5 acuted at its apex; thyridial cell long, trianglular; apical portion of *Cu* vanished, leaving a white mark in that portion.

Posterior wing tranclucence, pale gray, broader than anterior wing, clothed short blackish pubescence. Veins fulvous, discoidal cell elongate, with short stalk;

apical forks nos. 1, 2, 3 and 5 present, all apical forks without stalks; apical fork no. 5 sharply acuted at its apex; thyridial cell absent.

Pronotum fulvous, with a pair of warts; warts with a few black setae; mesoscutum blackish brown, with a few long black setae; mesoscutellum fulvous, with a few long black setae; apical portion of metanotum blackish brown, remaining portion fulvous.

Abdomen fulvous; each tergite with a few black pubescence; the ninth sternite long produced backwards, rounded at its apical margin; the tenth sternite short, acuted at its apex. Inferior appendage one-jointed, clothed with black pubescence, basal portion thick, apical part narrow, excised at its apical margin in the lateral view. Penis-sheath elongate, inner margin serrate, acuted at its apex; apical margin of penis emarginated.

Measurement: Holotype, body 11.20mm, anterior wing 16.10mm, posterior wing 13.75mm,

Holotype: Male (M. 2570) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; October 26, 1970; collected by K. SHIRAHATA.

Paratype: Male (M. 2507) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; September 18, 1969; collected by K. SHIRAHATA.

This new species closely resembles *Nothopsyche babai* KOBAYASHI in colour and venation of both wings, but is distinguished from the latter by the structures of male genitalia.

The specific name *yamagatensis* given to this species was taken from the name of locality.

### 33. *Stenophylax dentilus* sp. nov. (Plate 10. A, B, C, D, E, F, G, H)

Head fuscous; dorsum with three pair of warts; apical warts fuscous, with a few long setae; median wart fuscous, nearly longer than apical warts, with a few long setae; posterior warts fuscous, elongate, egg-shaped, with a long setae; all setae fuscous. Ocelli large, whitish milk, basal portion black.

Antennae fuscous, stout, as long as the length of anterior wing, clothed with fuscous pubescence; basal joint thick, long; the second joint half of basal joint; the third joint as long as basal joint; other joints nearly shorter than the third joint.

Maxillary palpi three-jointed, fulvous, clothed with fuscous pubescence; the first joint one third of the second joint; the second joint shorter than the third joint; the third joint long, rounded at its apex.

Labial palpi three-jointed, fulvous, clothed with fuscous pubescence, narrower and thinner than maxillary palpi; the first joint as long as the second joint; the third joint thick, longer than the second joint, rounded at its apex.

Legs fulvous; tibia and tarsus with many black spines; spurs 1, 3, 4; spurs fuscous; apical spur as long as preapical spurs; inner spur as long as preapical

spurs; inner spur as long as outer spurs; clow long, developed.

Anterior wing broad, short, with many fuscous spots; pterostigma indistinct; veins fulvous; discoidal cell elongate; thyridial cell nearly as long as discoidal cell; apical forks nos. 1, 2, 3 and 5 present; each forks without stalks.

Posterior wing translucent, as wide as the width of anterior wings, shorter than anterior wings; veins fulvous; discoidal cell closed, broad; apical cell elongate, the width of the second apical cell as wide as those the five apical cell; apical forks nos. 1, 2, 3 and 5 present; each forks without stalks.

Pronotum fuscous, with a pair of warts; warts fuscous, with a few long setae. The both side of metanotum fuscous, median part fulvous, with a pair of warts; warts elongate, with long fuscous setae. Postnotum of mesothorax fulvous. Metanotum fuscous.

Tergite fuscous, clothed with long pubescence, frontal margin fulvous; pleurite fuscous; sternite fuscous, clothed with long pubescence.

Genitalia, male: Apical margin of the eighth tergite turned downwards; the turned down part if heavily fringed with black setae; supperior appendage divided in to two lobes, each lobes rounded at its apex, with long setae; intermediate appendages long, produced upwards, with many teeth-shaped processes, apical margin especially with long teeth processes; inferior appendages short, crown-shaped in the lateral veiw, clothed with long setae.

Gentalia, female: The ninth tergite deeply excised at its apical margin to make of rather broad, nearly parallel, stout processes, acuted at its apex, finger-shaped from the lateral veiw; a somewhat similar pair of processes arises at the centre of the margin of the eighth sternite, shorter, broader at the base, and with more rounded apices as seen from the lateral veiw; between the bases of these processes is a samll, finger-shaped lobe.

Measurement: Holotype, body 10.00mm, anterior wing 16.05mm, posterior wing 13.65mm.

Holotype: Male (M. 2495a) in alcohol; Shenjogahara, Chokai National Park, Yamagata Prefecture; May 26, 1969; collected by K. SHIRAHATA.

Paratype: Five male (M. 2495b, M. 2495c, M. 2495d, M. 2495e, M. 2495f) in alcohol; Shenjogahara, Chokai National Park, Yamagata Prefecture; May 26, 1969; collected by K. SHIRAHATA.

Other specimens: 1 ♂ (M. 2470) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; 1 ♂ (M. 2508) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; September 18, 1969: 4 ♂ (M. 2495g-j) and 8 ♀ (M. 2495k-r) in alcohol; Mt. Azuma, Yamagata Prefecture; May 26, 1469: K. SHIRAHATA legs.

This new species very much to other species of genus *Stenophylax* in venations and in colour, but it can easily be distinguished by the structure of male genitalia.

The specific name *dentilus* given to this species was taken from the structure

of the male genitalia.

34. *Nemotulius admorsus* M.C. LACHLAN

1 ♀ (M. 2469) in alcohol; Imagami-onsen Tozawa-mura, Mogami-gun, Yamagata Prefecture; September 6, 1968; K. SHIRAHATA leg.

35. *Nemotulius brevilinea* M.C. LACHLAN

1 ♀ (M. 2489) in alcohol; Mt. Haguro, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; August 17, 1969; K. SHIRAHATA legs.

36. *Chilostigma* sp.

1 ♀ (M. 2567) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; October 26, 1970; K. SHIRAHATA leg.

37. *Limnophilus coreptus* M.C. LACHLAN

1 ♀ (M. 2501) in alcohol; Kitashennichi-cho, Shakata-shi Yamagata Prefecture; September 29, 1968; 1 ♂ (M. 2566) in alcohol; Minoyama, Hirata-machi, Akumi-gun, Yamagata Prefecture; October 1, 1970; K. SHIRAHATA legs.

38. *Limnophilus fuscovittatus* MATSUMURA

1 ♂ (M. 2573a) and 1 ♀ (M. 2573b) in alcohol; Tsukiyamashizu, Ashahi-mura, Higashitagawa-gun, Yamagata Prefecture; October 1, 1970; K. SHIRAHATA legs.

39. *Parapsyche maculata* ULMER

1 ♂ (M. 2585) in alcohol; Shekigawa, Atsumi-machi, Nishitagawa-gun, Yamagata Prefecture; June 13, 1970; 1 ♂ (M. 2578) in alcohol; Mihamra, Chokai National Park, Yamagata Prefecture; July 24, 1970; 1 ♂ (M. 2558) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; August 27, 1970; K. SHIRAHATA legs.

40. *Aractopsyche spinifera* ULMER

1 ♂ (M. 2486) in alcohol; Tsukiyamashizu, Higashitagawa-gun, Yamagata Prefecture; September 18, 1967; 1 ♂ (M. 2496) in alcohol; Shinjogahara, Chokai National Park, Yamagata Prefecture; May 26, 1969; 1 ♂ (M. 2580) in alcohol; Mihamra, Chokai National Park, Yamagata Prefecture; July 24, 1970; 1 ♂ (M. 2554) in alcohol; Niitakayu, Mt. Azuma, Yamagata Prefecture; August 27, 1970; K. SHIRAHATA leg.

### References

BANKS, N. 1960. New Trichoptera from Japan. Proc. Ent. Soc. Wash., 7 (2-3): 106-113.

\_\_\_\_\_. 1947. Some neuropterous insects from Szechwan, China. Fieldiana-Zoology (Chicago Nat. Hist. Mus.), 31: 98-107.

BOTOSANEANUS, L. 1970. Trichoptères de la République Démocratique Populaire de Dorée. Ann. Zool., Wroclaw, 27 (5): 275-359.

KIMMINS, D. E. 1958. The Identity of *Stenopsyche griseipeensi* Mc. LACHLAN (Trichoptera, Family Stenopsychidae). Bull. Brit. Mus. (N. H.), Entology, London, 6, 10: 253-260.

KOBAYASHI, M. 1954. A New Species of *Parastenopsyche* from Japan. Bull. Nat. Sci. Mus. Tokyo, 1 (2): 79-81, pl. 24.

\_\_\_\_\_. 1955. A New Species of *Dinarthrodes* from Japan. Bull. Nat. Sci. Mus. Tokyo, 2 (2): 70-72, pl. 14.

\_\_\_\_\_. 1957. On a New Species of *Goera* from Kyushū, Japan (Trichoptera). Bull. Nat. Sci. Mus. Tokyo, 3 (4): 276-278, pl. 44.

\_\_\_\_\_. 1959. A New Species of *Arctopsyche* from Japan. Bull. Nat. Sci. Mus. 3 (2): 83-85, pl. 18.

\_\_\_\_\_. 1959. Caddisfly Fauna of the Vicinity of Yoshii-Machi, Fukuoka Prefecture, with Descriptions of Five New Species. Bull. Nat. Sci. Mus. Toko, 4 (3): 343-354.

\_\_\_\_\_. 1962. A New Genus and New Species of Limnophilidae from Hokkaido, Japan (Insecta: Trichoptera). Bull. Nat. Sci. Mus. 6 (2): 115-118.

\_\_\_\_\_. 1964. Notes on the Caddisflies of Hakkaido, with Descriptions of Two New Species (Insecta, Trichoptera). Bull. Nat. Mus. Tokyo, 7 (1): 83-90.

\_\_\_\_\_. 1968. Notes on the Caddisflies of Niigata Prefecture, with Six New Species. Bull. Kanagawa Pref. Mus. 1 (1): 1-12, 6pls.

\_\_\_\_\_. 1969. Four New Species of Trichoptera from Japan. Bull. Kanagawa Pref. Mus. 1 (2): 17-22, 2pls.

\_\_\_\_\_. 1971. Six New Species of Caddisflies from Tanzawa Mountain Mass, Kanagawa Prefecture, Japan. Bull. Kanagawa Pref. Mus. 1 (4): 1-7, 6pls.

\_\_\_\_\_. 1971. Studies on the Fauna and classification of Aquatic Insect (Trichoptera) in the Kanagawa Prefecture. Res. Rep. Kanagawa Pref. Mus. (N. H.) 3: 1-49, 24pls.

\_\_\_\_\_. 1972. On the New Species of the Genu *Glossosoma* from Japan (Trichoptera, Insecta). Bull. Kanagawa Pref. Mus. 1 (5): 5-9, 2pls.

KUWAYAMA, S. 1972. On the genus *Perissoneura* McLachlan (Trichoptera: Odontoceridae). Kontyū, 40 (2): 77-79.

MARTYNOV, A. B. 1910. Les Trichoptères de la Sibérie et des Régions Adjacentes, II. Ann. Mus. Zool.. Imp. Sci. St. Petersbourg, 15: 351-429.

\_\_\_\_\_. 1930. On the Trichopterous fauna of China and Tibet. Proc. Zool. Soc. London. pp. 65-112.

\_\_\_\_\_. 1931. Report on a collection of insects of the Order Trichoptera from Siam and China. U. S. Nat. Mus., 79: 1-20.

\_\_\_\_\_. 1933. On the interesting collection of Trichoptera from Japan. Annt. Zool. Japonenses. 14: 139-156.

NAKAHARA, W. 1913. The Caddis-Flies (Trichoptera) of Japan I. Family *Phryganeidae*. Canad. Entom., 45: 323-327.

\_\_\_\_\_. 1915. The Caddis-Flies (Trichoptera) of Japan II. Canad. Entom. 74: 90-96.

ROSS, H. H. 1956. Evolution and classification of the mountain caddisflies. Univ. Illinois Press, Urbana. pp. 1-213.

SCHID, F. 1953. Contribution à l'etude de la sousfamille des Apatanias (Trichoptera, Limnophilidae). I. Tijd. Entomo. 96: 109-167.

\_\_\_\_\_. 1954. Contribution a l'etude de la sous-Famille des Apatanniae (Trichoptera, Limnophilidae). II. Tijd. Entomo. 97: 1-74.

\_\_\_\_\_. 1955. Contribution a l'etude des Limnophilidae (Trichoptera). Mitt. Schwei. Entom. Ges., 28: 1-245.

\_\_\_\_\_. 1965. Quelques Trichopters de Chine I. Bonn. Zool. Beitr., 16: 127-154.

\_\_\_\_\_. 1956. Quelques Trichopters de Chine II. Bonn. Zool. Beitr., 16: 723-726.

\_\_\_\_\_. 1968. La Famille des Arctopsychides (Trichoptera). Mémo. Soc. Entomo. pp. 1-84.

\_\_\_\_\_. 1969. La Famille des Stenopsychides (Trichoptera). Canad. Entomo. 100 (2): 187-224, 7pls.

TSUDA, M. 1936. Untersuchungen über die Japanischen Wasserinsekten, II. Lepidostomatinae (Trichoptera). Annot. Zool. Japonenses. 15 (3): 400-405, 1pl.

\_\_\_\_\_. 1939. Zur Kenntnis der Japanischen Apataniinen (Limnophilidae, Trichoptera). Annot. Zool. Japonenses 18 (4): 290-292. pl. 15.

\_\_\_\_\_. 1939. Zur Kenntnis des Japanischen Philopotamiden (Trichoptera). Annot. Zool. Japonenses. 18 (4): 275-279.

\_\_\_\_\_. 1940. Zur Kenntnis der Japanischen Hydropsycheden (Trichoptera). Annot. Zool. Japonenses. 19 (1): 23-34.

\_\_\_\_\_. 1940. Zur Kenntnis der Japanischen Rhyacophilidae (Trichoptera). Annot. Zool. Japonenses. 19 (2): 119-135.

\_\_\_\_\_. 1942. Zur Kenntnis der Koreanischen Trichopteren. Mem. Coll. Sci. Kyoto Univ. Ser. B. 17 (1): 227-237.

\_\_\_\_\_. 1942. Japanische Trichopteren I. Systematik. Mem. Coll. Sci. Kyoto Univ. Ser. B. 17 (1): 239-339.

\_\_\_\_\_. 1943. Eine Neue Chinesischen Köcherfliege. *Leptocerus kashingensis*. Jour. Shanghai Sci. Inst. New Series. 2 (4): 105-106.

\_\_\_\_\_. Zwei Neue Hydropsyche-Arten (Trichoptera) aus Japan. Trans. Kansai Entomo. Soci. 14 (2): 20-21.

\_\_\_\_\_. and KAWAI, T. 1967. Zwei Neue Rhyacophila Arten aus Japan. Kontyû, 35 (2): 111-112.

ULMER, G. 1908. Japanese Trichopteren. Deutsche Ent. Seitschr., 3: 339-355.

WIGGINS, G. B. 1959. A New family of Trichoptera from Asia. Acand. Entomo., 91(12): 745-757.

\_\_\_\_\_. 1968. Contributions to the Systematics of the Caddisfly Family Molannidae in Asia (Trichoptera). Lif. Sci. Contr. Rov. Ontario Mus. 72: 1-26.

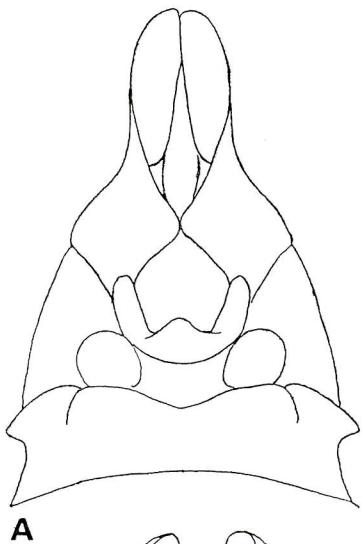
\_\_\_\_\_. 1969. A New Species of the Caddisfly Phryganopsychidae from Japan (Insecta: Trichoptera). Nat. Sci. Mus. Tokyo, 12 (2): 211-215.

\_\_\_\_\_. and KUWAYAMA, S. 1957. The Caddisfly genus Oligotricha in Japan with the

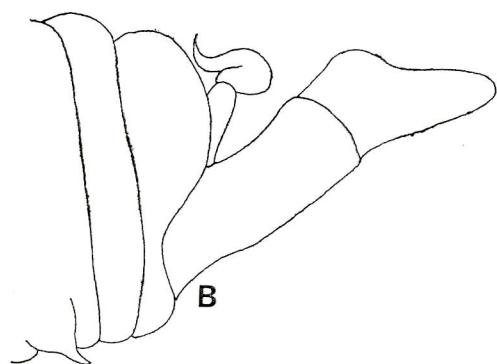
description of a new Species. Cont. Royal Ontario Mus. Div. Zool. 47: 1-8.

\_\_\_\_\_. A New species of the Caddisfly genus Oligotricha from Northern Japan and Sakalin, with a key to the adults of the genus (Trichoptera: Phryganidae). Konyû, 39 (4): 296-346.

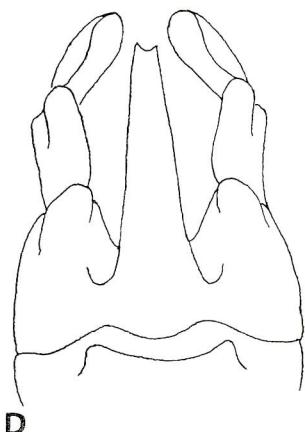
Journal of the Entomological Society of India  
Vol. 12, No. 1, January 1960  
pp. 41-48, 50-53, 55-58, 60-63, 65-68, 70-73, 75-78, 80-83, 85-88, 90-93, 95-98, 100-103, 105-108, 110-113, 115-118, 120-123, 125-128, 130-133, 135-138, 140-143, 145-148, 150-153, 155-158, 160-163, 165-168, 170-173, 175-178, 180-183, 185-188, 190-193, 195-198, 200-203, 205-208, 210-213, 215-218, 220-223, 225-228, 230-233, 235-238, 240-243, 245-248, 250-253, 255-258, 260-263, 265-268, 270-273, 275-278, 280-283, 285-288, 290-293, 295-298, 300-303, 305-308, 310-313, 315-318, 320-323, 325-328, 330-333, 335-338, 340-343, 345-348, 350-353, 355-358, 360-363, 365-368, 370-373, 375-378, 380-383, 385-388, 390-393, 395-398, 400-403, 405-408, 410-413, 415-418, 420-423, 425-428, 430-433, 435-438, 440-443, 445-448, 450-453, 455-458, 460-463, 465-468, 470-473, 475-478, 480-483, 485-488, 490-493, 495-498, 500-503, 505-508, 510-513, 515-518, 520-523, 525-528, 530-533, 535-538, 540-543, 545-548, 550-553, 555-558, 560-563, 565-568, 570-573, 575-578, 580-583, 585-588, 590-593, 595-598, 600-603, 605-608, 610-613, 615-618, 620-623, 625-628, 630-633, 635-638, 640-643, 645-648, 650-653, 655-658, 660-663, 665-668, 670-673, 675-678, 680-683, 685-688, 690-693, 695-698, 700-703, 705-708, 710-713, 715-718, 720-723, 725-728, 730-733, 735-738, 740-743, 745-748, 750-753, 755-758, 760-763, 765-768, 770-773, 775-778, 780-783, 785-788, 790-793, 795-798, 800-803, 805-808, 810-813, 815-818, 820-823, 825-828, 830-833, 835-838, 840-843, 845-848, 850-853, 855-858, 860-863, 865-868, 870-873, 875-878, 880-883, 885-888, 890-893, 895-898, 900-903, 905-908, 910-913, 915-918, 920-923, 925-928, 930-933, 935-938, 940-943, 945-948, 950-953, 955-958, 960-963, 965-968, 970-973, 975-978, 980-983, 985-988, 990-993, 995-998, 1000-1003, 1005-1008, 1010-1013, 1015-1018, 1020-1023, 1025-1028, 1030-1033, 1035-1038, 1040-1043, 1045-1048, 1050-1053, 1055-1058, 1060-1063, 1065-1068, 1070-1073, 1075-1078, 1080-1083, 1085-1088, 1090-1093, 1095-1098, 1100-1103, 1105-1108, 1110-1113, 1115-1118, 1120-1123, 1125-1128, 1130-1133, 1135-1138, 1140-1143, 1145-1148, 1150-1153, 1155-1158, 1160-1163, 1165-1168, 1170-1173, 1175-1178, 1180-1183, 1185-1188, 1190-1193, 1195-1198, 1200-1203, 1205-1208, 1210-1213, 1215-1218, 1220-1223, 1225-1228, 1230-1233, 1235-1238, 1240-1243, 1245-1248, 1250-1253, 1255-1258, 1260-1263, 1265-1268, 1270-1273, 1275-1278, 1280-1283, 1285-1288, 1290-1293, 1295-1298, 1300-1303, 1305-1308, 1310-1313, 1315-1318, 1320-1323, 1325-1328, 1330-1333, 1335-1338, 1340-1343, 1345-1348, 1350-1353, 1355-1358, 1360-1363, 1365-1368, 1370-1373, 1375-1378, 1380-1383, 1385-1388, 1390-1393, 1395-1398, 1400-1403, 1405-1408, 1410-1413, 1415-1418, 1420-1423, 1425-1428, 1430-1433, 1435-1438, 1440-1443, 1445-1448, 1450-1453, 1455-1458, 1460-1463, 1465-1468, 1470-1473, 1475-1478, 1480-1483, 1485-1488, 1490-1493, 1495-1498, 1500-1503, 1505-1508, 1510-1513, 1515-1518, 1520-1523, 1525-1528, 1530-1533, 1535-1538, 1540-1543, 1545-1548, 1550-1553, 1555-1558, 1560-1563, 1565-1568, 1570-1573, 1575-1578, 1580-1583, 1585-1588, 1590-1593, 1595-1598, 1600-1603, 1605-1608, 1610-1613, 1615-1618, 1620-1623, 1625-1628, 1630-1633, 1635-1638, 1640-1643, 1645-1648, 1650-1653, 1655-1658, 1660-1663, 1665-1668, 1670-1673, 1675-1678, 1680-1683, 1685-1688, 1690-1693, 1695-1698, 1700-1703, 1705-1708, 1710-1713, 1715-1718, 1720-1723, 1725-1728, 1730-1733, 1735-1738, 1740-1743, 1745-1748, 1750-1753, 1755-1758, 1760-1763, 1765-1768, 1770-1773, 1775-1778, 1780-1783, 1785-1788, 1790-1793, 1795-1798, 1800-1803, 1805-1808, 1810-1813, 1815-1818, 1820-1823, 1825-1828, 1830-1833, 1835-1838, 1840-1843, 1845-1848, 1850-1853, 1855-1858, 1860-1863, 1865-1868, 1870-1873, 1875-1878, 1880-1883, 1885-1888, 1890-1893, 1895-1898, 1900-1903, 1905-1908, 1910-1913, 1915-1918, 1920-1923, 1925-1928, 1930-1933, 1935-1938, 1940-1943, 1945-1948, 1950-1953, 1955-1958, 1960-1963, 1965-1968, 1970-1973, 1975-1978, 1980-1983, 1985-1988, 1990-1993, 1995-1998, 2000-2003, 2005-2008, 2010-2013, 2015-2018, 2020-2023, 2025-2028, 2030-2033, 2035-2038, 2040-2043, 2045-2048, 2050-2053, 2055-2058, 2060-2063, 2065-2068, 2070-2073, 2075-2078, 2080-2083, 2085-2088, 2090-2093, 2095-2098, 2100-2103, 2105-2108, 2110-2113, 2115-2118, 2120-2123, 2125-2128, 2130-2133, 2135-2138, 2140-2143, 2145-2148, 2150-2153, 2155-2158, 2160-2163, 2165-2168, 2170-2173, 2175-2178, 2180-2183, 2185-2188, 2190-2193, 2195-2198, 2200-2203, 2205-2208, 2210-2213, 2215-2218, 2220-2223, 2225-2228, 2230-2233, 2235-2238, 2240-2243, 2245-2248, 2250-2253, 2255-2258, 2260-2263, 2265-2268, 2270-2273, 2275-2278, 2280-2283, 2285-2288, 2290-2293, 2295-2298, 2300-2303, 2305-2308, 2310-2313, 2315-2318, 2320-2323, 2325-2328, 2330-2333, 2335-2338, 2340-2343, 2345-2348, 2350-2353, 2355-2358, 2360-2363, 2365-2368, 2370-2373, 2375-2378, 2380-2383, 2385-2388, 2390-2393, 2395-2398, 2400-2403, 2405-2408, 2410-2413, 2415-2418, 2420-2423, 2425-2428, 2430-2433, 2435-2438, 2440-2443, 2445-2448, 2450-2453, 2455-2458, 2460-2463, 2465-2468, 2470-2473, 2475-2478, 2480-2483, 2485-2488, 2490-2493, 2495-2498, 2500-2503, 2505-2508, 2510-2513, 2515-2518, 2520-2523, 2525-2528, 2530-2533, 2535-2538, 2540-2543, 2545-2548, 2550-2553, 2555-2558, 2560-2563, 2565-2568, 2570-2573, 2575-2578, 2580-2583, 2585-2588, 2590-2593, 2595-2598, 2600-2603, 2605-2608, 2610-2613, 2615-2618, 2620-2623, 2625-2628, 2630-2633, 2635-2638, 2640-2643, 2645-2648, 2650-2653, 2655-2658, 2660-2663, 2665-2668, 2670-2673, 2675-2678, 2680-2683, 2685-2688, 2690-2693, 2695-2698, 2700-2703, 2705-2708, 2710-2713, 2715-2718, 2720-2723, 2725-2728, 2730-2733, 2735-2738, 2740-2743, 2745-2748, 2750-2753, 2755-2758, 2760-2763, 2765-2768, 2770-2773, 2775-2778, 2780-2783, 2785-2788, 2790-2793, 2795-2798, 2800-2803, 2805-2808, 2810-2813, 2815-2818, 2820-2823, 2825-2828, 2830-2833, 2835-2838, 2840-2843, 2845-2848, 2850-2853, 2855-2858, 2860-2863, 2865-2868, 2870-2873, 2875-2878, 2880-2883, 2885-2888, 2890-2893, 2895-2898, 2900-2903, 2905-2908, 2910-2913, 2915-2918, 2920-2923, 2925-2928, 2930-2933, 2935-2938, 2940-2943, 2945-2948, 2950-2953, 2955-2958, 2960-2963, 2965-2968, 2970-2973, 2975-2978, 2980-2983, 2985-2988, 2990-2993, 2995-2998, 3000-3003, 3005-3008, 3010-3013, 3015-3018, 3020-3023, 3025-3028, 3030-3033, 3035-3038, 3040-3043, 3045-3048, 3050-3053, 3055-3058, 3060-3063, 3065-3068, 3070-3073, 3075-3078, 3080-3083, 3085-3088, 3090-3093, 3095-3098, 3100-3103, 3105-3108, 3110-3113, 3115-3118, 3120-3123, 3125-3128, 3130-3133, 3135-3138, 3140-3143, 3145-3148, 3150-3153, 3155-3158, 3160-3163, 3165-3168, 3170-3173, 3175-3178, 3180-3183, 3185-3188, 3190-3193, 3195-3198, 3200-3203, 3205-3208, 3210-3213, 3215-3218, 3220-3223, 3225-3228, 3230-3233, 3235-3238, 3240-3243, 3245-3248, 3250-3253, 3255-3258, 3260-3263, 3265-3268, 3270-3273, 3275-3278, 3280-3283, 3285-3288, 3290-3293, 3295-3298, 3300-3303, 3305-3308, 3310-3313, 3315-3318, 3320-3323, 3325-3328, 3330-3333, 3335-3338, 3340-3343, 3345-3348, 3350-3353, 3355-3358, 3360-3363, 3365-3368, 3370-3373, 3375-3378, 3380-3383, 3385-3388, 3390-3393, 3395-3398, 3400-3403, 3405-3408, 3410-3413, 3415-3418, 3420-3423, 3425-3428, 3430-3433, 3435-3438, 3440-3443, 3445-3448, 3450-3453, 3455-3458, 3460-3463, 3465-3468, 3470-3473, 3475-3478, 3480-3483, 3485-3488, 3490-3493, 3495-3498, 3500-3503, 3505-3508, 3510-3513, 3515-3518, 3520-3523, 3525-3528, 3530-3533, 3535-3538, 3540-3543, 3545-3548, 3550-3553, 3555-3558, 3560-3563, 3565-3568, 3570-3573, 3575-3578, 3580-3583, 3585-3588, 3590-3593, 3595-3598, 3600-3603, 3605-3608, 3610-3613, 3615-3618, 3620-3623, 3625-3628, 3630-3633, 3635-3638, 3640-3643, 3645-3648, 3650-3653, 3655-3658, 3660-3663, 3665-3668, 3670-3673, 3675-3678, 3680-3683, 3685-3688, 3690-3693, 3695-3698, 3700-3703, 3705-3708, 3710-3713, 3715-3718, 3720-3723, 3725-3728, 3730-3733, 3735-3738, 3740-3743, 3745-3748, 3750-3753, 3755-3758, 3760-3763, 3765-3768, 3770-3773, 3775-3778, 3780-3783, 3785-3788, 3790-3793, 3795-3798, 3800-3803, 3805-3808, 3810-3813, 3815-3818, 3820-3823, 3825-3828, 3830-3833, 3835-3838, 3840-3843, 3845-3848, 3850-3853, 3855-3858, 3860-3863, 3865-3868, 3870-3873, 3875-3878, 3880-3883, 3885-3888, 3890-3893, 3895-3898, 3900-3903, 3905-3908, 3910-3913, 3915-3918, 3920-3923, 3925-3928, 3930-3933, 3935-3938, 3940-3943, 3945-3948, 3950-3953, 3955-3958, 3960-3963, 3965-3968, 3970-3973, 3975-3978, 3980-3983, 3985-3988, 3990-3993, 3995-3998, 4000-4003, 4005-4008, 4010-4013, 4015-4018, 4020-4023, 4025-4028, 4030-4033, 4035-4038, 4040-4043, 4045-4048, 4050-4053, 4055-4058, 4060-4063, 4065-4068, 4070-4073, 4075-4078, 4080-4083, 4085-4088, 4090-4093, 4095-4098, 4100-4103, 4105-4108, 4110-4113, 4115-4118, 4120-4123, 4125-4128, 4130-4133, 4135-4138, 4140-4143, 4145-4148, 4150-4153, 4155-4158, 4160-4163, 4165-4168, 4170-4173, 4175-4178, 4180-4183, 4185-4188, 4190-4193, 4195-4198, 4200-4203, 4205-4208, 4210-4213, 4215-4218, 4220-4223, 4225-4228, 4230-4233, 4235-4238, 4240-4243, 4245-4248, 4250-4253, 4255-4258, 4260-4263, 4265-4268, 4270-4273, 4275-4278, 4280-4283, 4285-4288, 4290-4293, 4295-4298, 4300-4303, 4305-4308, 4310-4313, 4315-4318, 4320-4323, 4325-4328, 4330-4333, 4335-4338, 4340-4343, 4345-4348, 4350-4353, 4355-4358, 4360-4363, 4365-4368, 4370-4373, 4375-4378, 4380-4383, 4385-4388, 4390-4393, 4395-4398, 4400-4403, 4405-4408, 4410-4413, 4415-4418, 4420-4423, 4425-4428, 4430-4433, 4435-4438, 4440-4443, 4445-4448, 4450-4453, 4455-4458, 4460-4463, 4465-4468, 4470-4473, 4475-4478, 4480-4483, 4485-4488, 4490-4493, 4495-4498, 4500-4503, 4505-4508, 4510-4513, 4515-4518, 4520-4523, 4525-4528, 4530-4533, 4535-4538, 4540-4543, 4545-4548, 4550-4553, 4555-4558, 4560-4563, 4565-4568, 4570-4573, 4575-4578, 4580-4583, 4585-4588, 4590-4593, 4595-4598, 4600-4603, 4605-4608, 4610-4613, 4615-4618, 4620-4623, 4625-4628, 4630-4633, 4635-4638, 4640-4643, 4645-4648, 4650-4653, 4655-4658, 4660-4663, 4665-4668, 4670-4673, 4675-4678, 4680-4683, 4685-4688, 4690-4693, 4695-4698, 4700-4703, 4705-4708, 4710-4713, 4715-4718, 4720-4723, 4725-4728, 4730-4733, 4735-4738, 4740-4743, 4745-4748, 4750-4753, 4755-4758, 4760-4763, 4765-4768, 4770-4773, 4775-4778, 4780-4783, 4785-4788, 4790-4793, 4795-4798, 4800-4803, 4805-4808, 4810-4813, 4815-4818, 4820-4823, 4825-4828, 4830-4833, 4835-4838, 4840-4843, 4845-4848, 4850-4853, 4855-4858, 4860-4863, 4865-4868, 4870-4873, 4875-4878, 4880-4883, 4885-4888, 4890-4893, 4895-4898, 4900-4903, 4905-4908, 4910-4913, 4915-4918, 4920-4923, 4925-4928, 4930-4933, 4935-4938, 4940-4943, 4945-4948, 4950-4953, 4955-4958, 4960-4963, 4965-4968, 4970-4973, 4975-4978, 4980-4983, 4985-4988, 4990-4993, 4995-4998, 5000-5003, 5005-5008, 5010-5013, 5015-5018, 5020-5023, 5025-5028, 5030-5033, 5035-5038, 5040-5043, 5045-5048, 5050-5053, 5055-5058, 5060-5063, 5065-5068, 5070-5073, 5075-5078, 5080-5083, 5085-5088, 5090-5093, 5095-5098, 5100-5103, 5105-5108, 5110-5113, 5115-5118, 5120-5123, 5125-5128, 5130-5133, 5135-5138, 5140-5143, 5145-5148, 5150-5153, 5155-5158, 5160-5163, 5165-5168, 5170-5173, 5175-5178, 5180-5183, 5185-5188, 5190-5193, 5195-5198, 5200-5203, 5205-5208, 5210-5213, 5215-5218, 5220-5223, 5225-5228, 5230-5233, 5235-5238, 5240-5243, 5245-5248, 5250-5253, 5255-5258, 5260-5263, 5265-5268, 5270-5273, 5275-5278, 5280-5283, 5285-5288, 5290-5293, 5295-5298, 5300-5303, 5305-5308, 5310-5313, 5315-5318, 5320-5323, 5325-5328, 5330-5333, 5335-5338, 5340-5343, 5345-5348, 5350-5353, 5355-5358, 5360-5363, 5365-5368, 5370-5373, 5375-5378, 5380-5383, 5385-5388, 5390-5393, 5395-5398, 5400-5403, 5405-5408, 5410-5413, 5415-5418, 5420-5423, 5425-5428, 5430-5433, 5435-5438, 5440-5443, 5445-5448, 5450-5453, 5455-5458, 5460-5463, 5465-5468, 5470-5473, 5475-5478, 5480-5483, 5485-5488, 5490-5493, 5495-5498, 5500-5503, 5505-5508, 5510-5513, 5515-5518, 5520-5523, 5525-5528, 5530-5533, 5535-5538, 5540-5543, 5545-5548, 5550-5553, 5555-5558, 5560-5563, 5565-5568, 5570-5573, 5575-5578, 5580-5583, 5585-5588, 5590-5593, 5595-5598, 5600-5603, 5605-5608, 5610-5613, 5615-5618, 5620-5623, 5625-5628, 5630-5633, 5635-5638, 5640-5643, 5645-5648, 5650-5653, 5655-5658, 5660-5663, 5665-5668, 5670-5673, 5675-5678, 5680-5683, 5685-5688, 5690-5693, 5695-5698, 5700-5703, 5705-5708, 5710-5713, 5715-5718, 5720-5723, 5725-5728, 5730-5733, 5735-5738, 5740-5743, 5745-5748, 5750-5753, 5755-5758, 5760-5763, 5765-5768, 5770-5773, 5775-5778, 5780-5783, 5785-5788, 5790-5793, 5795-5798, 5800-5803, 5805-5808, 5810-5813, 58



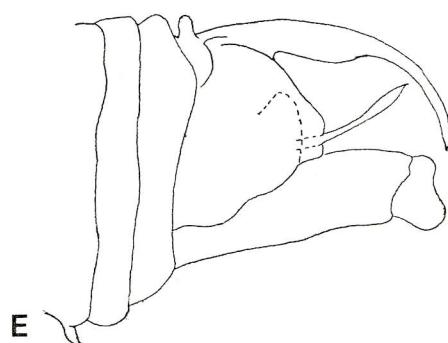
**A**



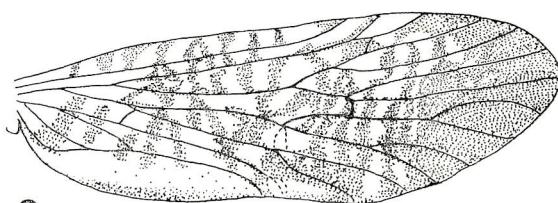
**B**



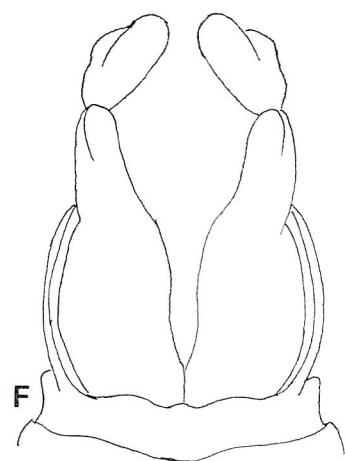
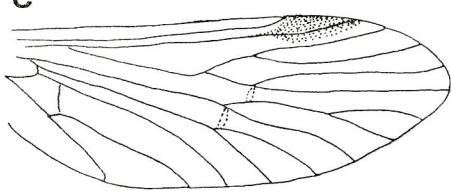
**D**



**E**



**C**



**F**

#### **Explanation of Plate 4**

A-D. Wings and Male genitalia of *Rhyacophila mayensis* sp. nov.

A. Wings.

B-D. Male genitalia.

B. Dorsal view.

C. Lateral view.

D. Ventral view.

E-H. Wings and Male genitalia of *Rhyacophila tachikawana* sp. nov.

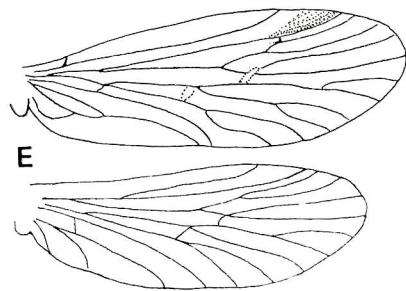
E. Wings.

F-H. Male genitalia.

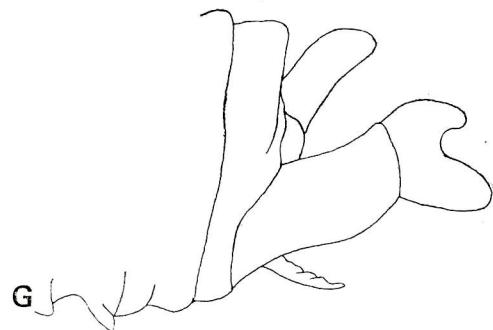
F. Dorsal view.

G. Lateral view.

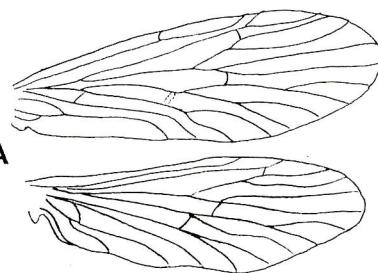
H. Ventral view.



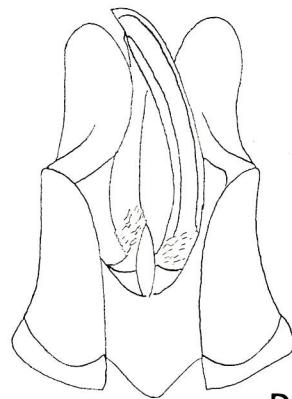
E



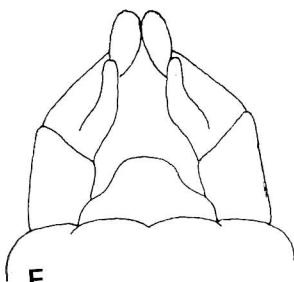
G



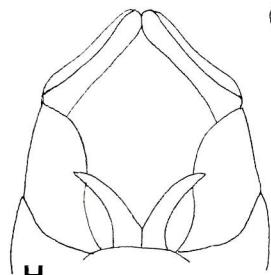
A



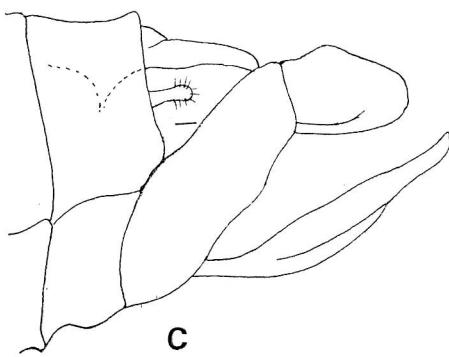
D



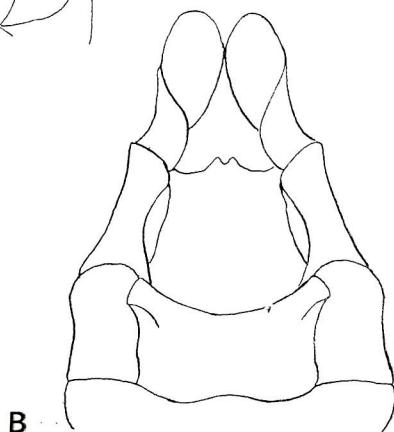
F



H



C



B

#### **Explanation of Plate 5**

A-D. Wings and Male genitalia of *Rhyacophila shekigawana* sp. nov.

A. Wings.

B-D. Male genitalia.

B. Dorsal view.

C. Lateral view.

D. Ventral view.

E-H. Wings and Male genitalia of *Rhhacophila azumaensis* sp. nov.

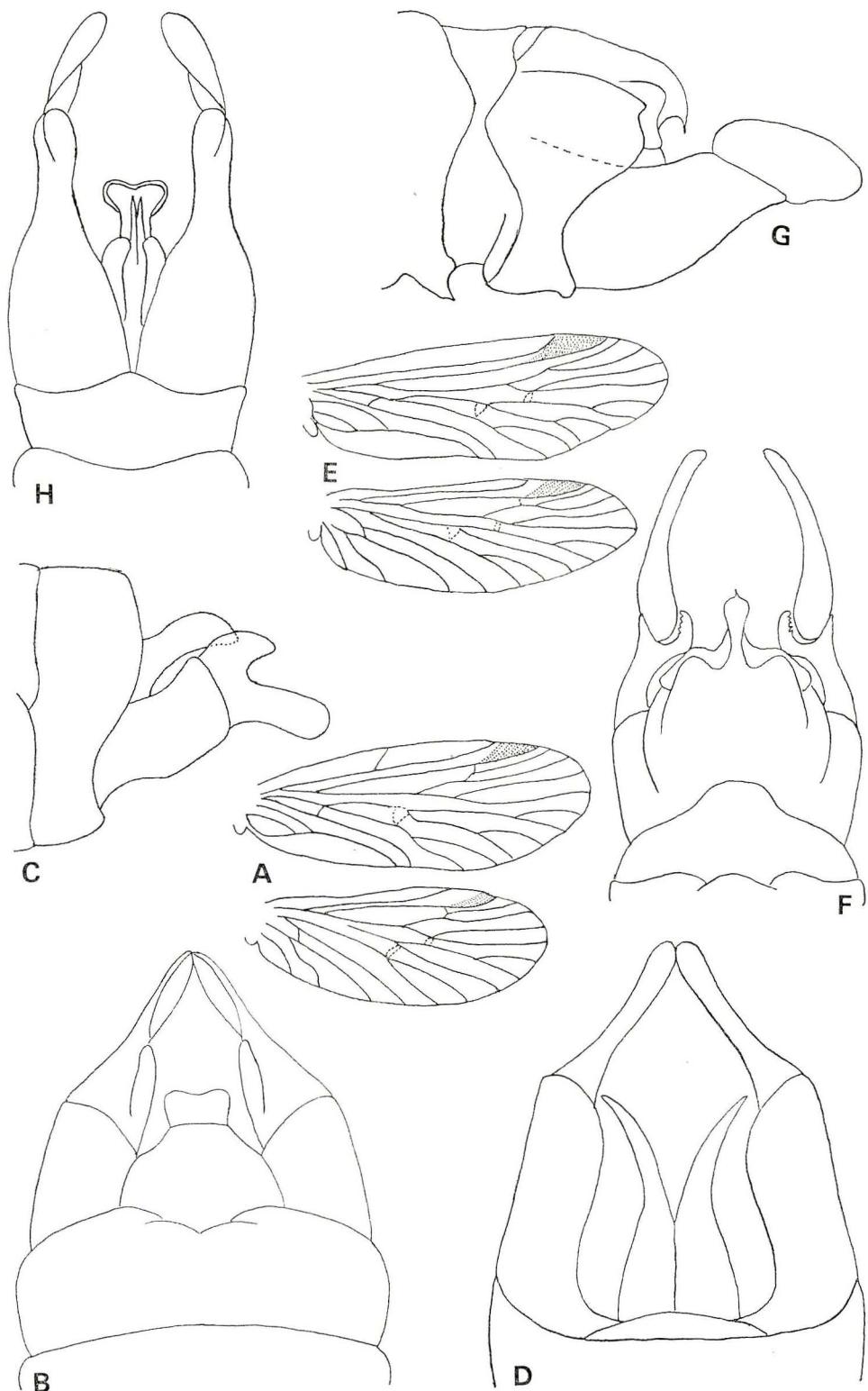
E. Wings.

F-G. Male genitalia.

F. Dorsal view.

G. Lateral view.

H. Ventral view.



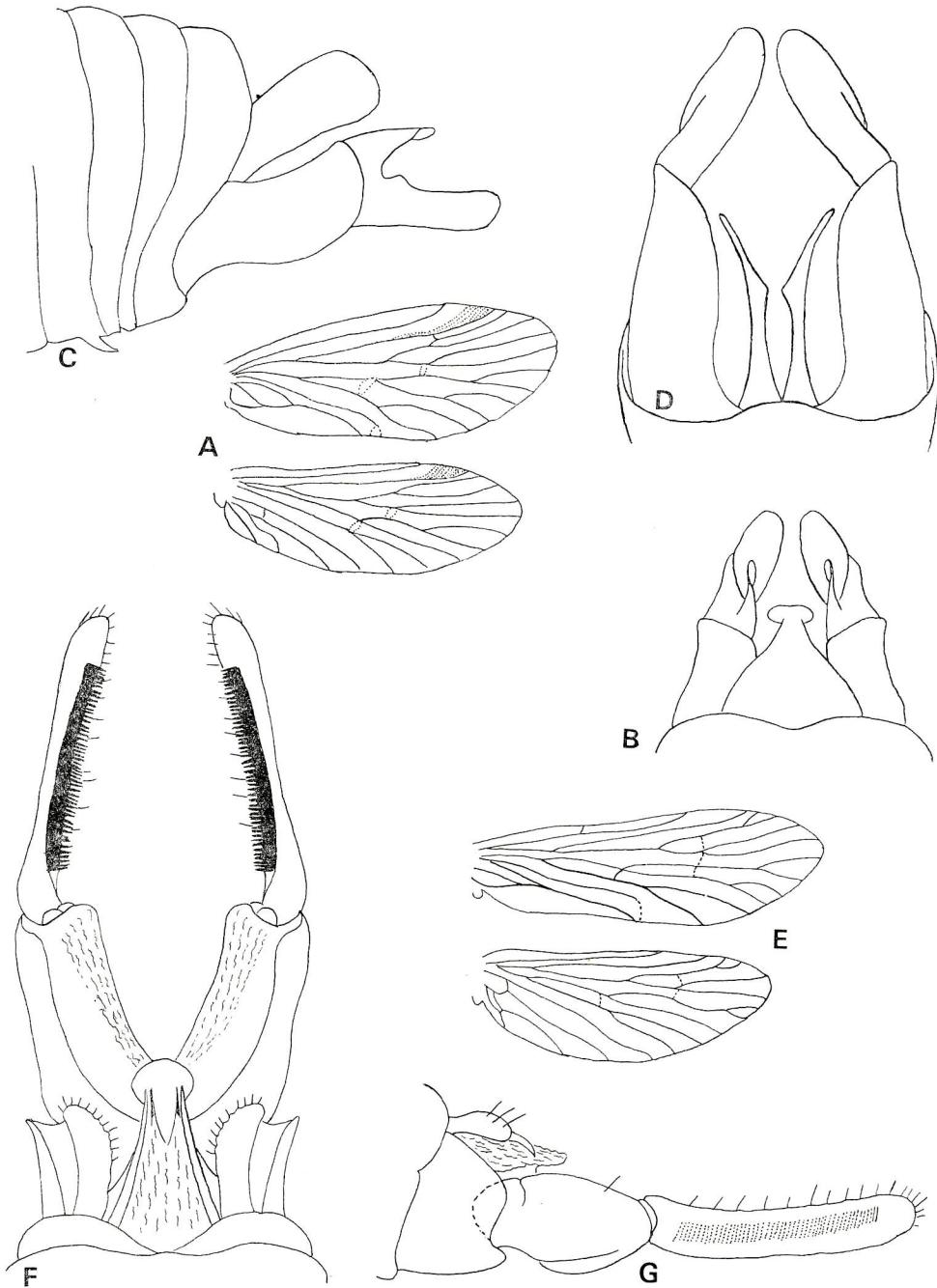
#### **Explanation of Plate 6**

A-D. Wing and Male genitalia of *Rhyacophila minoyamaensis* sp. nov.

- A. Wings.
- B-D. Male genitalia.
  - B. Dorsal view.
  - C. Lateral view.
  - D. Ventral view.

E-G. Wings and Male genitalia of *Sortosa niitakaensis* sp. nov.

- E. Wings.
- F. Dorsal view.
- G. Lateral view.



#### **Explanation of Plate 7**

A-D. Wings and Male genitalia of *Diprectrona tohokuensis* sp. nov.

A. Wings.

B-D. Male genitalia.

B. Lateral view.

C. Dorsal view.

D. Ventral view.

E-H. Wings and Male genitalia of *Apatania chokaiensis* sp. nov.

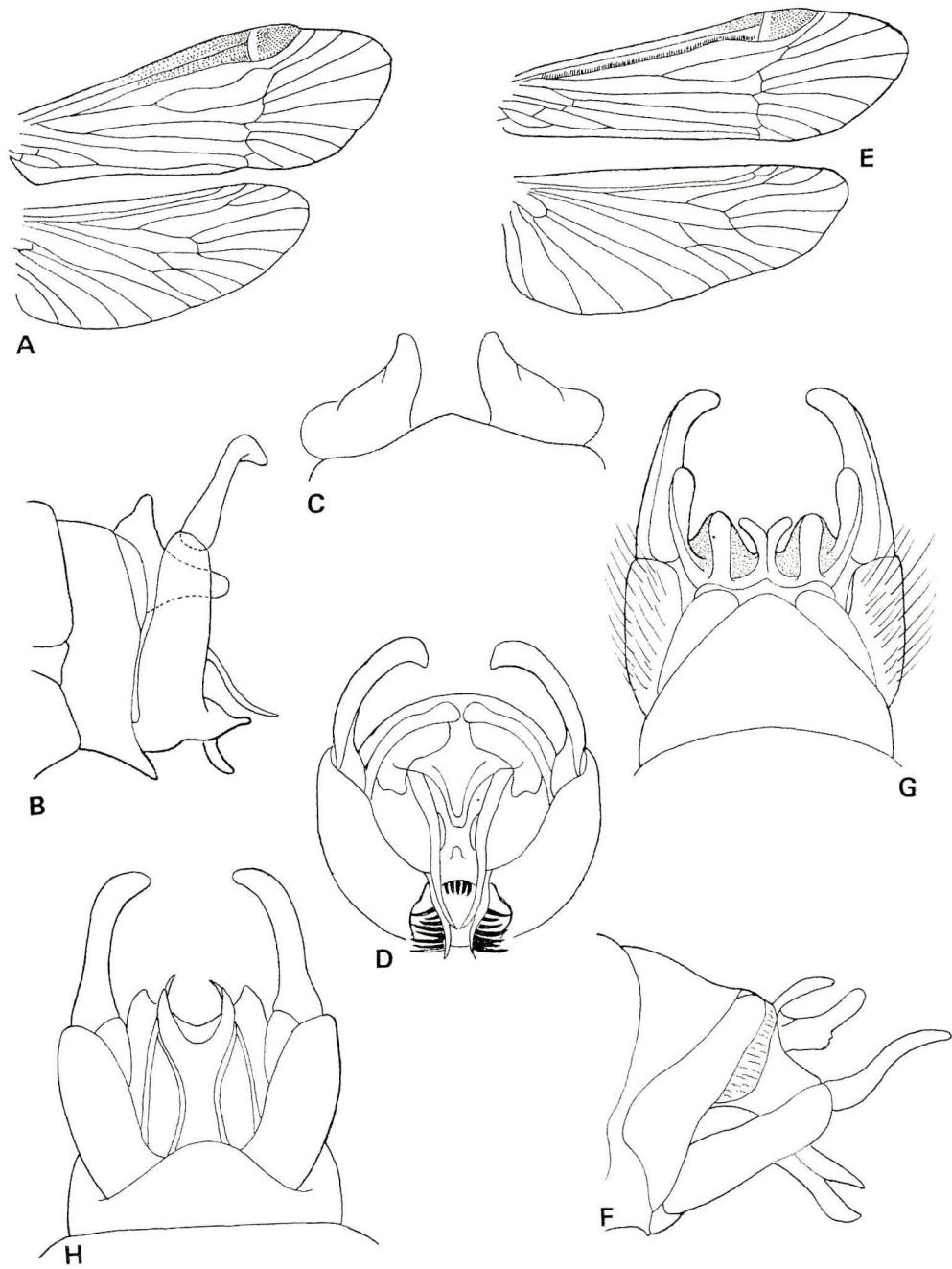
E. Wings.

F-H. Male genitalia.

F. Lateral view.

G. Dorsal view.

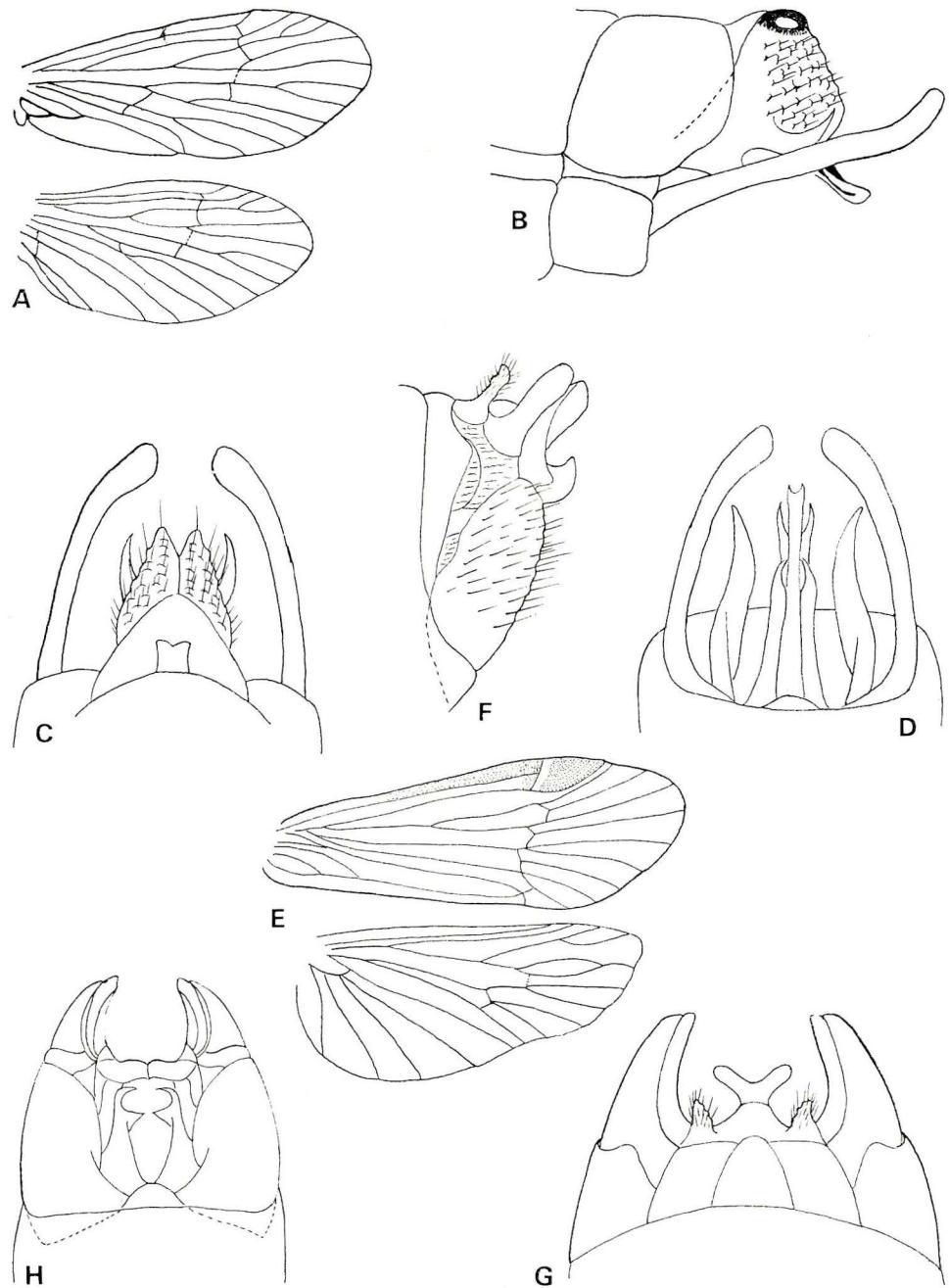
H. Ventral view.



#### **Explanation of Plate 9**

*Nothopsyche yamagataensis* sp. nov.

- A. Wings.
- B-E. Male genitalia
- B. Lateral view.
- C. Dorsal view.
- D. Ventro-caudal view.



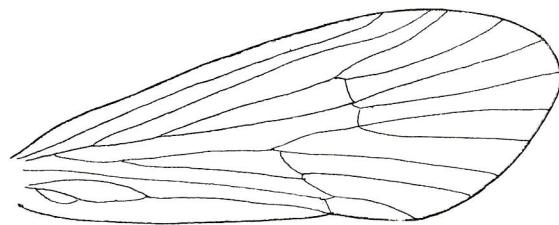
### **Explanation of Plate 8**

A-D. Wings and Male genitalia of *Apatania momoyaensis* sp. nov.

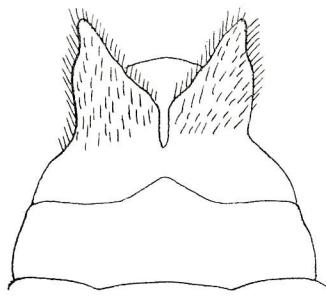
- A. Wings.
- B-D. Male genitalia.
  - B. Latral view.
  - C. Dorsal view.
  - D. Ventro-caudal view.

E-H. Wings and Male genitalia of *Apatania shirahatai* sp. nov.

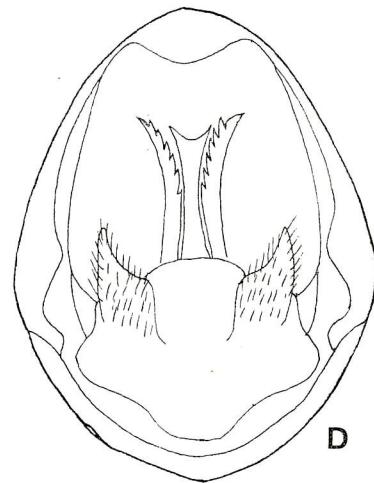
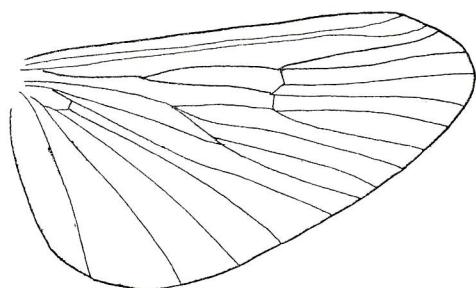
- E. Wings.
- F-H. Male genitalia.
  - F. Lateral view.
  - G. Dorsal view.
  - H. Ventral view.



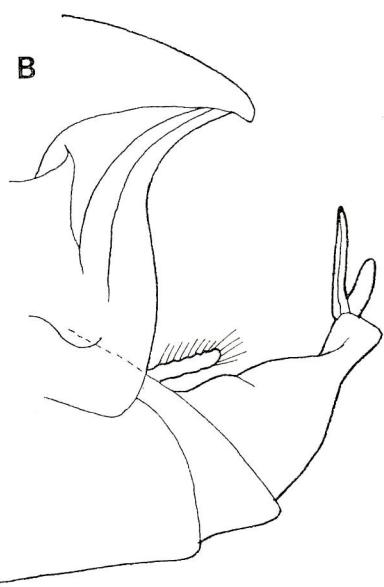
A



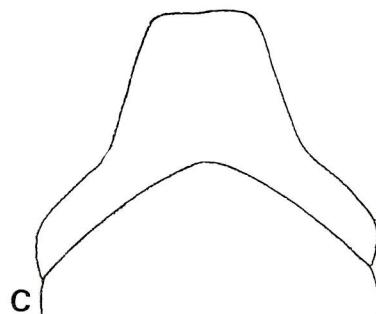
E



D



B

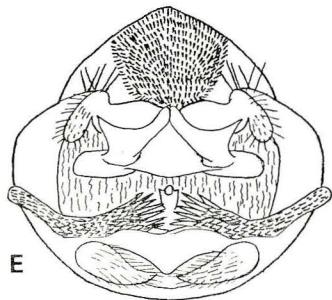


C

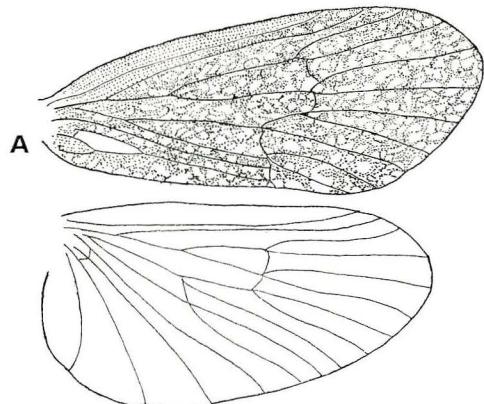
#### **Explanation of Plate 10**

*Stenophylax dentilus* sp. nov.

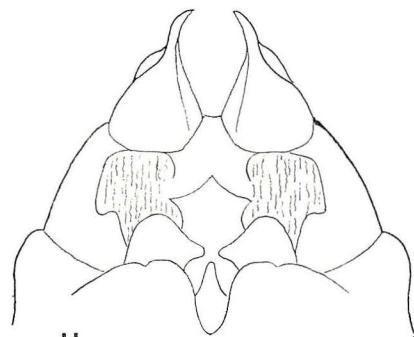
- A. Wings.
- B-E. Male ganitalia.
- B. Dorsal view.
- C. Latral view.
- D. Ventral view.
- E. Ventro-caudal view.
- F-H. Female ganitalia.
- F. Dorsal view.
- G. Lateral view.
- H. Ventral view.



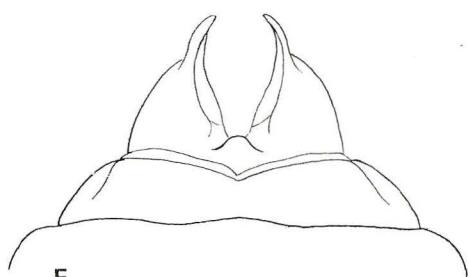
E



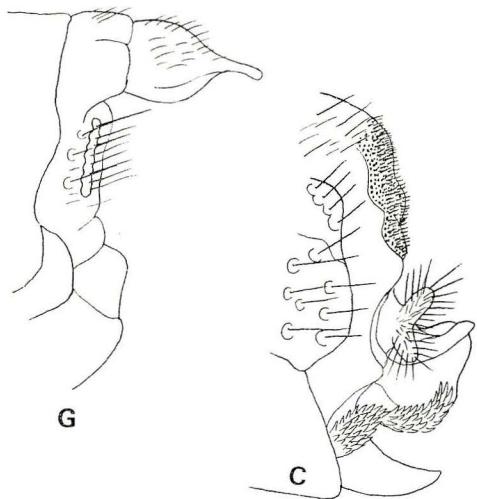
A



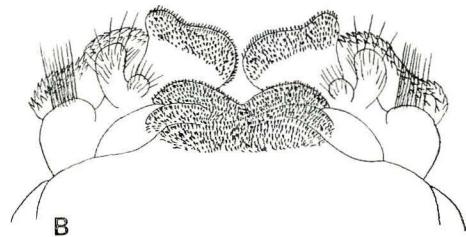
H



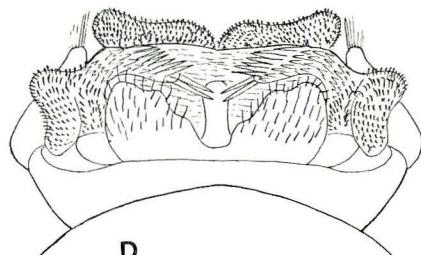
F



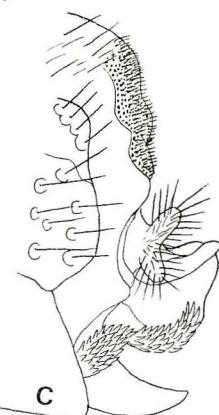
G



B



D



C